MARINE REVIEW

VOL. XX. Published every Thursday at 418-19 Perry-Payne Bldg., by the Marine Review Pub. Co. CLEVELAND, O., AUGUST 31, 1899. Entered at Cleveland Postoffice as second class matter. No. 9

NO YEAR LIKE THIS.

LAKE SHIPPING SEASON WILL CERTAINLY CLOSE WITH GREAT QUANTITIES OF FREIGHT UNMOVED--SHIPPERS BUYING VESSELS IN ORDER TO CARRY OUT THEIR OBLIGATIONS.

In all the years of navigation on the great lakes there has been no year like this year. Higher freights have been paid and greater earnings credited to the ships, for this year the great bulk of the fleet is tied up on low ore contracts, but at no other time has there been such a scramble to buy vessels or charter them outright; and the prices, especially for old wooden vessels, seem fabulous when compared with the figures at which the same property could have been purchased last winter. A ship of the 6,000-ton type, which could have been built just previous to the boom at about $215,000, would earn in the balance of the present season, if ready to begin work now without contract engagements of any kind, full $50,000. This estimate will convey an idea of the situation. But there are few ships now coming out to take advantage of the good things in freight lines. Five cents a bushel freight on wheat from Duluth to Buffalo means enormous earnings for the ship of 200,000 bushels capacity. It is a big freight also for the small vessels. But the remarkable feature of the situation is the fact that even at this rate the grain shippers are more than likely to find themselves unable to move the northwest grain crop that has only begun to arrive at the head of the lakes.

It is true that when a market is found for a grain crop like that now moving from the northwest, the question of lake freight does not stop shipments. Carrying charges are added to the price of the grain, freights go up to a point that will attract the ships from other lines, and the grain goes on to the seaboard. But now the ships are wanted in all other lines as well as in grain, and there is certainly reason to doubt whether all of the grain that will be offered for shipment can be moved, no matter what freight may be offered on it. The indications are certainly in that direction.

Some of the ore companies, finding that they were in danger of not being able to move their ore, and looking also to the great probability of a similar state of affairs next year, have turned in and bought or chartered outright quite a large number of vessels, many of them not very good, of course, but in the aggregate of considerable capacity. One of these firms, Corrigan, McKinney & Co., has bought ten vessels, the aggregate capacity of which is 17,200 gross tons per trip and the purchase price about $257,000 in all. This fleet includes the steamers Minnesota, St. Paul, Progress, Iron Chief and Iron Duke, and the barges Halloran, F. D. Ewen, John M. Hutchinson, Iron Cliff and Iron Age. There is only one explanation of the purchase of these vessels. They are not of a kind that would be bought by an ore concern except as a result of such conditions as now prevail. The purchasers undoubtedly figure that even if they sell the whole fleet again at a marked difference in price next fall it will pay them to do so rather than take the chance of being unable to move their ore during the balance of the present year and in the most active part of next season. All vessels of this kind are, of course, free of contracts and will be available for immediate service.

Another Cleveland ore house, Tod, Stambaugh & Co., has managed to secure in all six vessels of about 15,000 gross tons aggregate capacity, but their dealings are in the nature of charters for the balance of the season and not purchases. Several days ago they engaged the steamer Amazonas and consort Armenia, and the Iron King and consort Iron Queen. Now they have added the steamers Bermuda and Brazil, which were chartered to them by Hutchinson & Co. of Cleveland, and which will be managed by that firm.

The statement that the Pierpont Morgan interests of New York, now controlling the Hocking Valley Ry., as well as extensive coal properties in the Hocking valley of Ohio, are to purchase or build ships on a large scale for moving their coal to the northwest, is not warranted by the facts connected with the sale of two of the Davidson wooden vessels the Appomattox and Santiago, to these interests a few days ago. The transfer made through W. C. Richardson of Cleveland, was to the Boston Coal Dock & Wharf Co., of which N. Monsarrat is president. Mr. Monsarrat, who is president of the Hocking Valley company, occupies the same position in the dock and wharf company by reason of his management of the railway. The dock and wharf company is a corporation controlling terminals of the railway, just as the Buckeye Coal & Railway Co., another Morgan corporation, has to do with mines. It is understood that some one of the interests in the Hocking Valley had coal sold for Milwaukee delivery that must go forward. Chances could not be taken as to the charter of vessels. Two ships like the Appomattox and Santiago could certainly be used to great advantage next year as well as for the balance of the present year. They were therefore bought outright and turned over to Pickands, Mather & Co., vessel owners of Cleveland, for management. It may be that the Morgan coal interests of Ohio will eventually acquire vessels, just as the ore companies have worked into the business, and that the new coal consolidation of the Pennsylvania district will also undertake the transportation of its coal by lake, but there can be no decided move in that direction for the present, and probably not for a long time to come, even if it was planned now.

The sale of the wooden steamer City of Rome at Detroit, Wednesday, furnishes evidence of the scramble for vessels. The City of Rome was sold by the United States marshal to satisfy a claim of the Detroit Ship Building Co., which was hanging fire because of differences between underwriters and the owners of the vessel, which was ashore last fall on Lake Erie. Vessel owners from all parts of the lakes were in attendance at the sale. There were some twenty of them present. A few months ago the vessel would have been bid in by her owners with little if any competition, but the bidding at Wednesday's sale was very spirited, and she was finally sold to J. C. Gilchrist of Cleveland for $56,040. It is said that an expenditure of $15,000 to $17,000 will be required on the ship to bring her up to her former rating. The City of Rome carries 90,000 bushels of wheat or 2,800 tons of coal on 16½ feet draught, and makes about 9 miles loaded and 11 miles light.

The Rittenhouse & Embree Co., lumber shippers of Chicago, a few days ago purchased from J. C. Gilchrist of Cleveland, the steamer Oregon and schooner S. H. Foster.

PITTSBURGH COAL CONSOLIDATION.

Subscriptions to the extent of $33,000,000 were entered in a few days for the stock of the Pittsburg Coal Co., and this without any of the stock allotted to New York or Chicago. The demand for the stock was such that it would probably have been subscribed almost twice over in Pittsburg and Cleveland, without effort of any kind in the larger money centers; but it was evident from the beginning that the subscription was not to be of a public kind. This is the consolidation that takes over all the soft coal mining properties of the Pittsburg district, together with dock interests on Lake Erie and at Chicago and Duluth, and which is to be capitalized at $64,000,000, of which $32,000,000 is to be preferred 7 per cent cumulative stock and $32,000,000 common stock. Full particulars of the organization were published in the last issue of the Review. As 70 per cent common stock goes with subscriptions for the preferred, it will be seen that the issue was over-subscribed without reference to what will be required by the large New York interests represented by Moore & Schley, who have been financing the undertaking. This consolidation is looked upon as one of the strongest things in the so-called trust line that has as yet been planned. Osborne, Saeger & Co. of Cleveland are said to be the largest subscribers at $2,600,000, with F. L. Robbins of Pittsburg, down for $2,500,000 and M. A. Hanna & Co. of Cleveland, for $2,000,000. The management will be vested in a board of directors of eleven and an executive committee of five. It is generally understood that F. L. Robbins of Pittsburg, will be chairman of the board and Mr. F. M. Osborne of Cleveland, president. It is more than probable that M. H. Taylor and D. R. Hanna will also be on the board. Mr. C. W. Baine of the Morgan, Moore & Baine Co., Cleveland, is said to be slated for secretary and Mr. Upson Andrews for treasurer.

CONTINUANCE OF THE SOCIETY OF NAVAL ENGINEERS.

Officers of the American Society of Naval Engineers have recently been in receipt of many inquiries as to the propriety of retaining the individuality of the society, now that the personnel bill has removed the name of engineer corps from the navy lists. Some of the officers who are unqualifiedly in favor of a continuance of the organization say that these inquiries, while not unnatural, indicate a total misunderstanding of the spirit of the bill. They claim that not only does the naval engineer exist in the American navy today quite as distinctively as he ever did, but the whole tenor of the personnel bill is to expand the number of engineers by the addition of line officers. Eventually this must be the result, as essentially the modern naval officer must be an engineer. The stand is also taken that there is existent no profession which is advancing more rapidly scientifically than naval engineering and consequently there can not well be any diminution of the interest therein.

At a recent special meeting of the council of the society the votes on the proposed change in Article 5 of the by-laws, as noted in a recent number of the Review, were counted with the result that assent to the change was found to be almost unanimous. Of the votes cast 123 were in favor of the change and five against. The secretary of the society also calls attention to the fact that the by-laws direct that nominations for officers for the ensuing year shall be considered at the regular meeting on the first Tuesday in October, and emphasis is placed on the observation that while as a rule most of the nominations are made by members residing in Washington it is by no means necessary that this should be so. Nominations will be made separately for president, secretary-treasurer and for three members of council

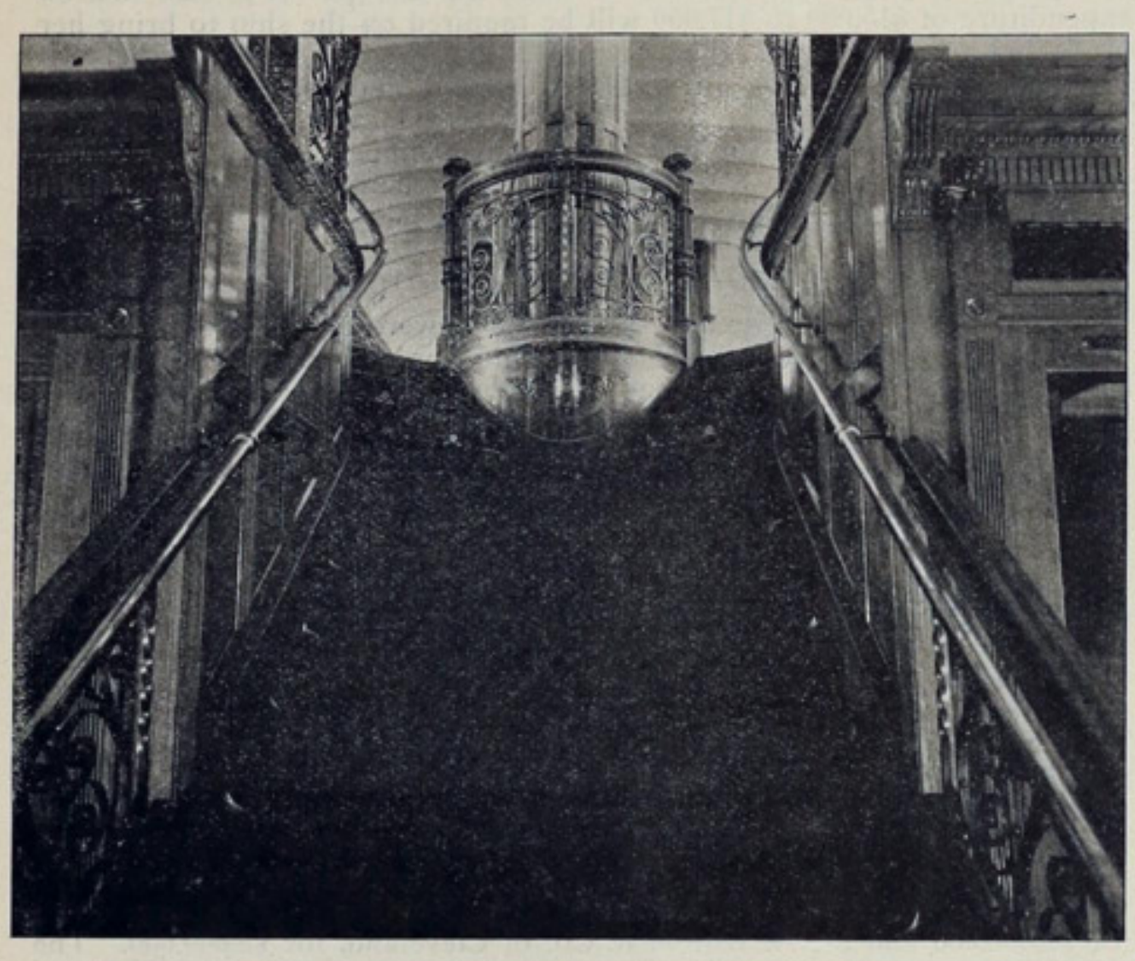
TRIAL OF THE ALABAMA.

The builder's trial of the battleship Alabama, off the Delaware coast a few days since, was entirely satisfactory in every particular. Officials of the Wm. Cramp & Sons Co., which built the battleship, were more than enthusiastic over the showings made, and several officers of the Russian navy who were on board expressed themselves as most favorably impressed with the sea-going qualities of the vessel. There was a drizzling rain during a considerable portion of the run and a heavy fog hung over the water throughout the day but the trial nevertheless resulted in the development of 17¼ knots, whereas the contract requires a speed of but 16 knots. On the first run the Alabama, under 103½ revolutions, averaged 15.25 knots an hour, over a course of 11¼ knots. She steamed over the course twice in a moderate sea, half of the way against the wind. On the second run under forced draft and at 114½ revolutions, the average speed was 16.33 knots, and on this run the maximum of 17¼ knots was attained. The trial was made in the open sea and in shoal water, between the northwest and southeast five-fathom lights. The wind was from the northeast and about 30 miles an hour.

PASSENGER STEAMER ILLINOIS.

VIEWS OF AN 18-MILE BOAT IN SERVICE ON LAKE MICHIGAN—A VERY SUCCESSFUL SHIP.

Officials of both the Chicago Ship Building Co. and the Northern Michigan Transportation Co. are highly pleased over the success of the steamer Illinois, built at the Chicago yard last winter and which went into commission on Lake Michigan with the opening of the passenger season. The success of this vessel will very probably result in the construction of a duplicate ship at Chicago during the coming winter for the same company. Mr. W. I. Babcock, general manager of the Chicago company, gave personal attention to the construction of this vessel and has been



ENTRANCE TO MAIN SALOON, STEAMER ILLINOIS.

generally congratulated upon the result of his efforts. The Illinois recently made 18 miles by chart in 62 minutes and is a very fine sea boat. She has been running full of freight ever since she came out and has to sleep anywhere from thirty to fifty people on cots every night.

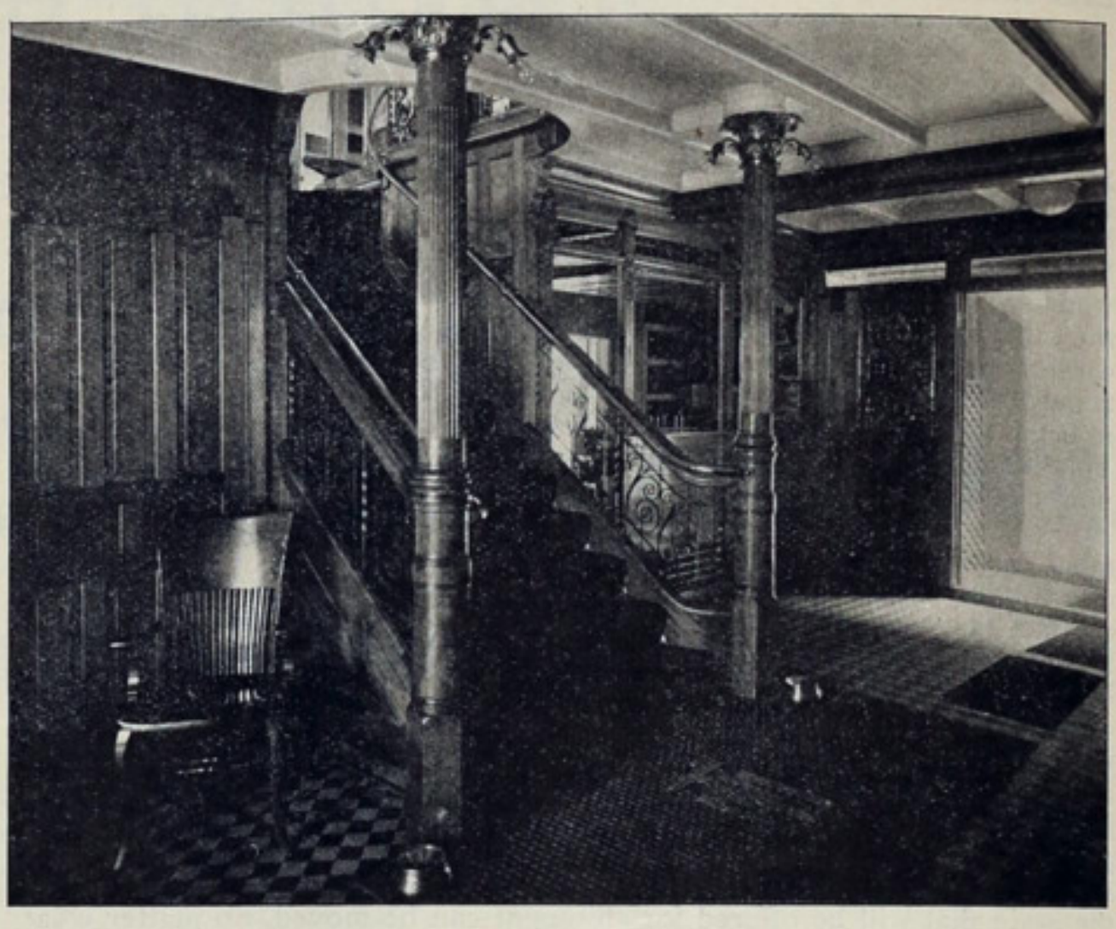
The Illinois is a steel passenger and freight steamer of the following dimensions: Length on keel, 225 feet; beam, moulded, 40 feet; depth, moulded, 16 feet. She has a triple expansion engine with cylinders of 20, 33 and 54 inches diameter and 36 inches stroke, and two Scotch boilers 12½ feet diameter by 11½ feet long, arranged for forced draft on the closed ash pit system and allowed a working pressure of 175 pounds. Her indicated horse power is 1,500 and extreme speed about 18 miles an hour. She has bunker capacity for 120 tons of coal, and can carry 700 tons of

MAIN CABIN AND DINING ROOM, STEAMER ILLINOIS.

cargo on 12 feet draught. There are seventy-seven state-rooms and total berthing accommodation for 224 first-class passengers. All staterooms are fitted with open, nickel plumbing and are provided with running water, both hot and cold. The crew, numbering seventy, with the exception of officers, are carried on orlop decks forward and aft. On the forward orlop deck is also located the galley and officers' mess room. The pantry is just forward of main saloon, the forward part of which is used as a dining room. The main deck, with the exception of the social hall aft and crew's mess rooms forward, is entirely given up to freight and baggage.

The main saloon is on the spar deck and is lighted by a dome running all fore-and-aft, on top of which is the upper saloon. The main saloon and social hall are finished in curly birch, the upper saloon in white enamel and gilt. The smoking room, located just forward of the upper saloon, is finished in golden oak and is fitted with leather-covered settees. Above the hurricane deck a bridge deck extends for about two-thirds the vessel's length at the height of the top of the upper saloon. On this deck are carried six metallic life boats and two rafts.

The vessel is lit throughout by electricity, furnished by two direct



VESTIBULE AND STAIRWAY, STEAMER ILLINOIS.

connected generators of 10 and 15 K. W. capacity, respectively. A searchlight is carried on top of the pilot house. There is a steam hydraulic elevator from the main deck to forward hold for handling freight, and dumb waiters from the main deck to galley and from pantry to galley. The vessel is provided with two stockless anchors, a steam capstan windlass forward and steam dock capstan aft. She is also fitted with hand and steam steering gear.

LAUNCH OF THE MARACAIBO.

Wilmington, Del., Aug. 30.—The Harlan & Hollingsworth Co. launched last Thursday the new freight and passenger steamer for the Red D line, Boulton, Bliss & Dallett of New York, agents. The Maracaibo was christened by Miss Mary Dallas, daughter of J. T. Dallas, superintending engineer of the line. Representatives of the owners arrived in Wilmington about noon, and after lunch by the local firm witnessed the launch. The Maracaibo is built under the American Shipmasters' rules, is 277 feet 6 inches long over all; 266 feet between perpendiculars; 37 feet beam, moulded, and is built to carry 800 gross tons on 10 feet draught, with accommodations for about 100 passengers. She has seven water tight bulkheads, two steel masts and tank capacity of 200 tons; propelled by two triple expansion engines of 14, 22 and 36 inches diameter of cylinders and 24-inch stroke; fed by two Scotch boilers, 12 feet 3 inches by 12 feet; six furnaces; two Manganese bronze solid propellers; 160 pounds boiler pressure.

Immediately after the Maracaibo was launched, there was laid down on her ways a new coastwise ship for the Metropolitan Steamship Co. of New York. The Maracaibo is the fifth ship launched by the Harlan & Hollingsworth Co. since the beginning of the year, and she will probably be followed next month by the second ship for the New York & Porto Rico Steamship Co., to be called the San Juan. The Ponce, which was launched last month, will probably have her trial trip and delivery some time during September, as will also the torpedo boat Stringham, which is nearly completed. It is confidently expected that the Stringham will exceed her contract speed of 30 knots. This company a few days ago contracted for three large tugs for the Pennsylvania Co. and these together with the two ships building for the New York & Baltimore Trans. line, the steamer for the Windsor line, and the two torpedo boat destroyers, Hopkins and Hull, make an extremely busy yard, to say nothing of the many ships at the wharves undergoing repairs, together with the large amount of car work.

BATTLESHIP TRIALS.

In a short time now particulars of the trials of two new United States battleships will be available. It is expected that their performance will be of interest to naval architects and ship builders all over the world. One of these vessels is the Alabama, under construction at the yard of the Wm. Cramp & Sons Co. at Philadelphia. Her preliminary trials will in all probability be completed within a few days, and if everything goes well she will have her official trial late this autumn and will go into commission during the winter. The battleship Kearsarge, building at the yard of the Newport News Ship Building & Dry Dock Co., is now within less than 4 per cent of completion, and her trials will take place between Sept. 5 and 15.

WASHINGTON NAVY YARD.

EXTENSIVE IMPROVEMENTS THAT WILL GREATLY INCREASE ITS CAPACITY—THE BOTTLE FLEET OF THE HYDROGRAPHIC OFFICE.

WASHINGTON BUREAU, MARINE REVIEW, 1345 PENNSYLVANIA AVENUE, WASHINGTON, D. C., AUGUST 30, 1899.

The extensive improvements that have been in progress in the navy yard all summer are nearing completion. The southern addition to the great gun shop has been completed and the work which was begun two or three weeks ago on the northern addition is advancing. Commander Edwin C. Pendleton, under whose personal supervision it is being done, says that the bricklaying on the big shop will be finished about Sept. 1 and the new and old structure placed under new steel and iron roof during the fall.

The original section of this great gun shop has been for many years a menace to the lives of the people working under its wooden roof, which has done over fifty years' service and whose wooden scantlings had rotted almost through. The length of the old building—640 by 80 feet originally—will when completed measure 1,000 feet. Commander Pendleton has experienced some trouble with the brick work which was let out by contract. This obstacle was said to be due to the fact that the contractor had failed to put on a sufficient number of bricklayers to rapidly push the work along. It was desirable to get the new portion under roof so that the reroofing of the old section could proceed with more speed and the machinery and hundreds of guns thereunder protected from protracted exposure to the weather and rust. This trouble has resulted from the scarcity of bricklayers, there being only eleven of them engaged today on this work. The completed southern addition, however, is now occupied by machinery, guns and gun makers, and the work of relieving the old overstocked building of its freight preparatory to its modernizing is now progressing. These improvements will cost $125,000.

In addition to this most important improvement to Uncle Sam's great gun factory, it will be interesting to note the progress of the work in other sections of the yard. The gun carriage shops have, during the summer, received a general overhauling and have been provided with a new brick structure covering 250 by 60 feet and costing $160,000.

There has also been erected a brick foundry, which measures 22,500 square feet, a new storehouse for guns, 550 by 60 feet, and a large joiner shop for pattern and model making. The forge shop has been equipped with new and modern machinery and the old shop for making cartridge cases has also a new plant costing $200,000.

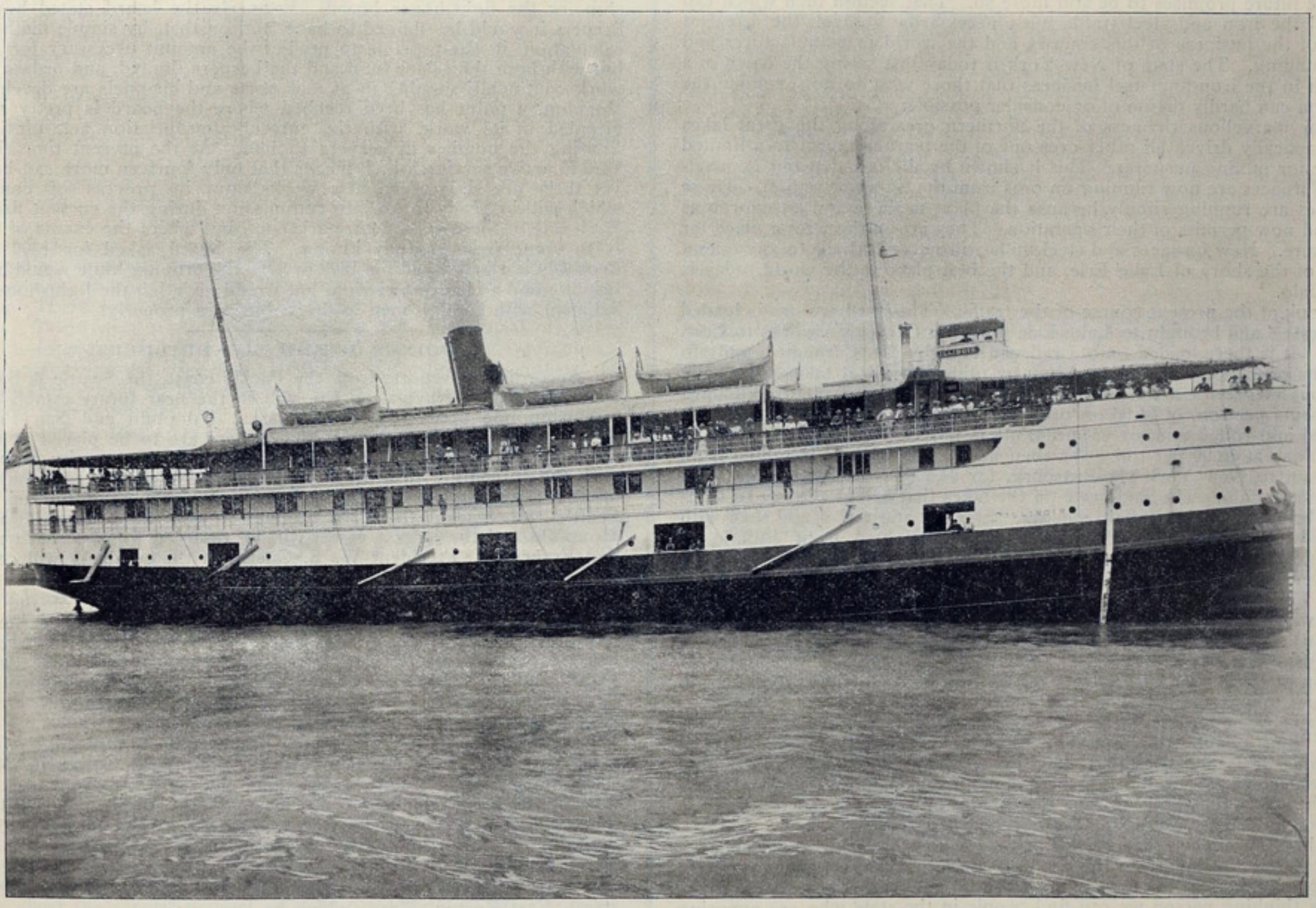
Enumerating the extent and importance of these great improvements and those contemplated, Commander Pendleton said that the yard would soon be capable of a working capacity 50 per cent. greater than formerly and the value of this work would be inestimable.

"This great undertaking," said he, "has only commenced. It should be continued until the facilities are complete. We have been working two or three shifts of men, consuming the entire twenty-four hours of the calendar day, in order to meet the demands for the guns for the new ships on the stocks. With the new plant it is hoped all emergencies will be covered without resort to overtime to avoid a blockade of work. Since their establishment as the national gun factory for the navy the Washington shops have needed all and more of the improvements which they are now getting. We have already the finest naval gun making plant on earth but its growth will not stop if the output of American gunnery is to keep pace with the growth and improvement of the American navy."

With this end in view the next congress will be asked by the secretary of the navy for the necessary appropriation to continue the work projected at the gun factory, so that the progress made this year can be continued until a practically entirely new and greatly enlarged plant is established.

Commander Pendleton says that there are big orders ahead for the gun factory, which grew out of the provision already made for the new battleships and cruisers. These are in addition to the gunnery now on lathe for the vessels on the stocks. Prominent among the orders to be filled are the great and small guns for the Ohio, the Missouri, the Maine, the Florida, the Wyoming and the Connecticut, and the sixteen torpedo boat destroyers and the twenty-six torpedo boats, all ordered within the last two years.

The naval hydrographic office has prepared an interesting account of the operations of the so-called bottle fleet during the past year. Over a thousand bottles were cast adrift and only a small portion of them have been recovered. A great majority of those that were picked up and sent back to Washington were found on the coast bordering on the Atlantic. This undoubtedly was the result of the bottles being thrown overboard in the Atlantic by captains leaving ports in this country. The map prepared by the hydrographic office shows that with one or two exceptions all bottles cast adrift in the Atlantic between Florida and Halifax within a few hundred miles of the coast took a northwesterly course, winding up on the English or French coast. The lines described by them are perfectly straight and show little variation. One bottle adopted a rather eccentric path. It escaped the currents followed by most of its fellows and starting from a point opposite the Massachusetts coast took a wider detour to the south. It passed within a few hundred miles of the Cape Verde islands and then fell into a strong current that sweeps along the northern coast of South America. It had straightened out in the direction of the gulf of Mexico when it became stranded on one of the Windward islands. It was two two years and six months on its journey, during which time it traversed 3,600 miles, an average of four miles a day.



PASSENGER AND FREIGHT STEAMER ILLINOIS, BUILT BY CHICAGO SHIP BUILDING CO.

Mr. Lewis Nixon, the well known proprietor of the Crescent Ship Yard, Elizabethport, N. J., is chairman of the committee on fireworks and music of the big celebration to be held at New York City upon the arrival of Admiral Dewey, and he is carrying out his portion of the program with that energy and enthusiasm so well known to his ship building friends. Mr. Nixon has planned to expend about $30,000 in fireworks displays—$500 for red fire along the coast, $5,000 for the illumination of city halls, and an equal amount for the illumination of the Brooklyn bridge.

TRAFFIC IN STEEL FOR ERIE CANAL.

BUFFALO WITH ITS PROJECTED $20,000,000 STEEL PLANT HAS GREAT VISIONS OF NEW INDUSTRIES IN NEW YORK STATE.

BY C. H. RAYMOND, BUFFALO.

The most casual examination of conditions now existing and prospects clearly in sight make the following statements easily maintained. If there was today no canal between Buffalo and Albany, the outlook for the state of New York is such that it would be justified in building a new canal capable of accommodating boats 125 feet long by 25 feet beam and having 8 feet draught of water. If the present canal is improved by widening the locks and deepening so that boats of above capacity can be used, twenty years from today will show the following state of things—it will doubtless come in fifteen years:

The city of Buffalo will then be the largest manufacturing city in the world in iron and steel. New York bay will build more steel vessels along its shores than any place in the world. The seat of manufacturing every class of iron and steel articles will be found throughout the entire length of the Erie canal and the Hudson river. The state of New York will have such a growth in manufacturing and population and the wealth that flows therefrom as it has never had in any twenty years of its history. The farmers of this state will have a better market for their products right at home than they have enjoyed in a generation.

These are bold statements, but will bear the closest scrutiny. The reason for this growth is very evident. This is an age of iron and steel and the future promises to be still more so. That section then which can control the iron and steel traffic must necessarily control the greatest share of the business of this country and the world in manufactures and ship building. The state of New York is today just seeing the dawn of a growth in the iron and steel business that those who do not examine the question can hardly dream of or consider possible.

The marvellous richness of the northern ores along the great lakes has practically driven all other ores out of the market except to a limited degree for mixing purposes. This is shown by the fact that old Pennsylvania furnaces are now running on ores from the Superior region. Those furnaces are running simply because the plant is there and an enormous demand now permits of their operation. They are in the wrong place for the future. New furnaces and steel mills will never be built to any extent south of the shore of Lake Erie, and the best place in the world today is at Buffalo.

Look at the present course of the traffic. The northern ore is loaded into vessels and brought to Lake Erie ports for Carnegie's works to Conneaut. It is there loaded onto a railroad built by Mr. Carnegie simply to save the profit formerly charged him by other roads. It takes practically two tons of ore for a ton of steel. Freight from Conneaut to Pittsburg is 98 cents per ton, of $1.96 on ore for a ton of steel. At Pittsburg it is smelted and rolled and for export trade is moved over the mountains to New York at $2.90 per ton. We then have a ton of steel freighted from Conneaut to New York via Pittsburg, for $4.86. Now follow this same steel via Buffalo. The same rate on the lakes that brings the ore to Conneaut brings it to the Buffalo smelter. Smelt it and roll it and then with a lock-widened and deepened canal it can be freighted from Buffalo to New York for 50 cents per ton, as against $4.86 via Pittsburg. We must, however, bear one thing in mind. Today coke for a ton of steel costs about 75 cents per ton more at Buffalo than at Pittsburg. (This is soon to be wiped out, as new coking coals are being developed 125 miles from Buffalo). Coal for steam purposes costs a trifle more at Buffalo than at Pittsburg. To be very safe, call the added coke and coal differential $1 per ton of steel. We then have steel via Buffalo, including this dollar, at $1.50 per ton, as against $4.86 via Pittsburg.

Can anyone for a moment doubt what is the future of New York state? These figures cannot be gainsaid. Pittsburg is today the great center of iron and steel industries, but she cannot retain that position any more than water can run up hill. If the people of this state use the good sense that they have they will improve the canals and soon take such a hold on the iron and steel business as can never be wrested from them. If Pittsburg had the chance that New York state now has, she would spend a hundred million dollars to improve the Erie canal. She can never have the opportunity. It is ours for a trifle, and astounding as it must appear to any thinking person we can find people in the state who are opposing the canals. However, the number is very small and will steadily grow less.

The canal problem must not be taken up on the score of its past history, or the past or present canal operations in any other country. We are now face to face with a square business proposition and a new situation. If the best interests of the state demand the improving the canal to enable us to glean the golden harvest just now coming into the light of day, let us do it like men and stop whining or making excuses. If the great state of New York has not sufficient business ability among its business men to see the great future that must come from the canals, why, close them up and stop talking about it longer. All previous talk of improving the canals has been for the grain traffic which our farmers, wrongly, however, think injures them to the benefit of the western farmer. This improvement, bringing as it will within the borders of the state an enormous amount of manufactures, will furnish to our farmers a home market for those products that the western farmer cannot ship here as cheaply as our own farmers.

Buffalo is alive to the possibilities and already has sufficient faith that the canals will be improved to inaugurate a company with twenty million dollars capital to build a steel plant which will be practically the largest in the world when finished.

Attention, Comrades! The Nickel Plate road has authorized special low rates to Philadelphia, account Annual Encampment G. A. R. Tickets on sale Sept. 1, 2, 3 and 4. See agents. 116, Sept. 4.

LACK OF LIGHT-HOUSE FUNDS.

The large number of new projects now being carried on under the direction of the light-house board, including the erection of a number of new light-houses and the construction of several light-ships and tenders, has served to again call attention to the inconvenience to which the light-house service has been put during recent years by the reductions made in appropriations asked from congress. Particularly has this been true in the case of the appropriations for the salaries of light-house keepers. Congress seems to have had the feeling for some years that it was wiser to give less than was asked and then make up what was necessary in a deficiency bill, than to do what it ought to at the outset. The number of keepers is continually increasing as the board finishes and puts into commission the new light stations. The rapidly increasing demands of commerce have induced congress to establish fog signals at many existing light stations, and it is fair to presume that this increase will continue; yet it is necessary to employ another lightkeeper at each station to which a fog signal is added, and there congress unwisely attempts its economies. Appropriations have been kept so small that the board has been unable to retain many trustworthy keepers or secure proper men for important positions, because it has had no money with which to increase a man's pay in proportion to his increased experience and value to the service. Several years ago the pay of light-keepers was fixed by statute at an average of $600 a year. As a matter of fact, the salaries range from $100 to $1000, but the number of keepers has to be so adjusted as to keep within the statutory average of pay.

Recently congress has added another touch to its scheme of frugality by limiting not only the gross amount that should be paid in salaries, but the number of keepers as well. This is a refinement of hardship for the light-house board. Formerly the board stated how many keepers it would be obliged to have, and on that, by simple mathematical calculation, it was possible to predict the amount necessary for salaries; but with both the salary fund and the keepers limited, and orders for new work continually coming in as new ports and channels are developed for shipping, a point has been reached where the board is pretty seriously crippled in its work, with the current appropriation act, for instance, limiting the number of keepers to 1400. At the present time there are 1386 in active service, which means that only fourteen more can be called; yet there are sixty-seven new works now in process of completion, which will be ready to go into commission during the current fiscal year. Each one of these will require a keeper, but where the excess of fourteen is to come from nobody knows. The board asked for 1500 keepers. Probably if it had asked for 1600 or 1700 the pruning knife would have had just as good a chance to swing, but would have left the light-house establishment with enough men to do its business properly.

DOINGS OF THE SHIP BUILDERS.

According to reports from the Pacific coast, the Seattle & San Francisco Railway & Navigation Co. will in the near future establish a new steamship line between Seattle, Alaska, Honolulu and San Francisco. These reports are to the effect that orders are to be placed at once for three modern steamers of 4,000, 4,500 and 6,000 tons capacity, respectively, with the stipulation that they are to be ready for delivery inside of ten months. The smallest vessel is to be placed in service on the run between Seattle and Alaska; the 4,500 ton vessel will run between Seattle and Honolulu and the largest vessel will be reserved for the coal trade with San Francisco. President W. E. Guerin of the company will come east in a short time to place the contracts for the vessels.

Capt. E. H. Smith of Springfield, Mass., owner of the steamer Mascot, will replace that vessel in the river trade next season with a larger and speedier vessel. The Mascot is 80 feet long, 15 feet beam, and has a capacity of 250 persons, whereas the new boat will be 100 feet in length and will have a speed of from 12 to 15 miles an hour. She will be a screw propeller, with two decks, and will be fitted with a complete electric lighting system, including a search light.

Work is reported to be progressing rapidly on the tug now under construction at Lewis Nixon's Crescent Ship Yard, Elizabeth, N. J., for Lieut. Commander John C. Fremont, supervisor of the port of New York. The boat, which is to be christened the Vigilant, is 112 feet over all, 98 feet on the water line, 22 feet beam, 13 feet depth and 8 feet draught. The fleet now under the jurisdiction of the supervisor consists of seven vessels.

John A. McKie has purchased the ship yard at 266 and 282 Border street, East Boston, Mass., which he has occupied since 1892. It has a frontage of about 200 feet and is 900 feet deep. The property includes a dry dock, carpenter, joiner and blacksmith shops, together with several smaller buildings, all equipped with modern tools for the construction and repair of vessels.

The Monongahela & Ohio Transportation Co. of Pittsburg has not yet awarded the contract for the machinery of the new excursion boat, now under construction at the ship yard of Knox & Son at Marietta, O.

It has been decided to name the four-masted steel ship now building at the yard of Arthur Sewall & Co., Bath, Me., Edward Sewall, in honor of the late senior member of the firm, who died in March, 1870.

The grain barge which has been under construction at the Gildersleeve ship yard at Middletown, Conn., was successfully launched a few days since.

The New England Navigation Co., a new corporation, will establish a ship yard at Newburyport, Mass., for the construction of wooden vessels.

Joseph Childs of Hope, Idaho, has just placed a contract for the construction of a small steamer for service on Pend D'Oreille lake.

Wolff & Zwicker, Portland, Ore., have laid the keel for a new vessel to be christened the Kvichak.

The veterans of '61 hold their annual encampment at Philadelphia. The Nickel Plate road offers special low rates for this occasion. Tickets sold Sept. 1 to 4 inclusive, good for stop-over privilege at Niagara Falls without extra charge. See agents. 117, Sept. 4.

AN AFFAIR OF NATIONS.

A MOVEMENT TO HOLD THE INTERNATIONAL NAVIGATION CONGRESS IN THIS COUNTRY IN 1902—THE BRUSSELS GATHERING AND THE CONGRESS AT PARIS NEXT YEAR.

An effort is being made to secure for the United States in 1902 the International Navigation Congress, which was held in Brussels in 1898 and which is to be held in Paris next year. Mr. E. L. Corthell, well known hydraulic engineer, who represented the United States at the Brussels congress, is already at work on the matter, enlisting the support of commercial organizations and engineering societies. It would seem somewhat early to be making preparations for a congress that is not to take place until 1902, but these congresses are affairs gotten up by nations and it will be necessary to enlist the support of congress at its next session if the meeting following the Paris meeting (the sessions are biennial) is to be held in this country. Mr. Corthell has consulted Secretary of State Hay and other Washington officials and it is hoped that the support of the state department will be given to the movement. Our congress will be asked to authorize the president to invite the congress when it assembles at Paris next year and thereafter the governments of the world.

The scope of these congresses is intended to and generally does embrace the following subjects: Canals, canalized rivers, ship-canals, river improvements, entrance channels, ports and harbors, their construction, maintenance and operation, practical questions involving appliances, plant, methods of navigation, etc. Papers are written upon these subjects, they are discussed, and the questions are decided upon by the congress itself. In organizing a congress the method generally followed is for the government of the country where the congress is to be held to invite other governments of the world to send their delegates. Invitations to the congress at Brussels were sent out by the minister of foreign affairs, corresponding to our secretary of state. Invitations were extended to all foreign governments, and the organizing committee invited societies, associations, etc., to send delegates. There were 121 government delegates representing twenty-four nations. Then there were delegates of municipalities, engineering and other technical societies, chambers of commerce, navigation associations and commercial and industrial organizations of various kinds interested in any way in the subject of navigation. Of these there were 410 delegates. Twelve engineering societies were represented by regularly constituted delegates. There were fifty-nine of these delegates. Twenty cities were represented as cities, with thirty-four delegates. There were thirty-seven chambers of commerce with fifty-six delegates. There were seventy-five navigation and commercial organizations with forty-five delegates. There were industrial and agricultural societies; manufacturers, like manufacturers of dredging machines; the John Cockerill Works at Seraing, and other similar works; steamship companies; ship-canal companies; in fact the whole range of navigation was represented at that congress. There were private members in addition to these, numbering 840; that is to say, not delegates of governments or municipalities. The total membership was 1,371. Of these 862 were from countries other than Belgium. There were in all thirty-five nationalities represented. The number of civil engineers was about 600.

Mr. Corthell will present to the state department in October next an elaborate report of the Brussels congress, which will serve as a basis for plans that may be adopted for the meeting in this country in 1902. In the Brussels congress there were five sections, divided into one, two, three or four sub-sections. The five sections were: First, canalized rivers; second, inland canals; third, tidal rivers and ship-canals; fourth, maritime ports; fifth, tolls, dues, port charges, warehouses, transfer sheds, docks and all the paraphernalia of ports. The engineers who wrote the papers were, many of them, appointed by their governments to write them; the best men in the countries were delegated to write important and thorough papers on these subjects, which were very fully, almost profusely, illustrated with plans of docks, warehouses, transfer sheds, locks, movable dams, canal sections, dredges and everything relating to facilities for navigation. This congress was conducted by holding two full meetings, one at the beginning and one at the end of the congress, where all the members assembled, and then, like the American Association for the Advancement of Science, the congress went into sectional meetings of the five sections. These meetings were continued during the whole week, and at the end of the week at the second general meeting the reports of these sections were read to the full congress and a vote taken by the congress upon the decisions which had previously been made by each of the sections. In other words, it is a business congress, not for the mere reading of papers and filing them away, but for definite conclusions as to the sentiment of those in attendance.

SCARCITY OF HEMP.

There has been a revival during the past few days of the reports which have appeared at intermittent intervals for some time past regarding the prospect of a famine in the hemp market. The immediate cause of the latest alarming reports seems to be found in a cablegram from a prominent Manilla house stating that in all probability little or no hemp would be shipped from the Philippine islands before the end of December next. Plausibility is given to this and other similar reports by the action of Manilla houses in seeking to procure the cancellation of contracts for the shipment of hemp at prices ruling quite recently. Receipts at all Philippine ports last week were 4,000 bales, and 3,000 bales the estimate for the current week. Two years ago the receipts for the corresponding week amounted to 24,000 bales. According to a New York dealer the total visible supply of hemp in first hands in this country is 2,300 bales.

The steam tenders recently completed by the Iowa Iron Works, Dubuque, Ia., for the Mississippi river commission, and which have been fully described in the Review, have been christened Sachem, Nokomis, Leota, Choctaw and Wynoke.

INLAND NAVIGATION IN FRANCE AND GERMANY.

Much has recently been written regarding the arousal of interest on the part of Germany in the development of both navy and merchant marine. Certainly the emperor has done all in his power to stimulate such an interest. There prevails in many quarters, however, an impression that the growth to foster which such effort is being made concerns itself only with the shipping engaged in the coastwise and foreign trades; On the other hand inland navigation plays a most important part, and the desire of the emperor that it shall be given even greater attention than at present is well illustrated by the vigor with which he has championed certain canal measures which have recently claimed public attention. Despite retarding influences, however, the growth of internal navigation in Germany has increased with surprising rapidity during the past few years. Indeed it is stated that the quantity of merchandise passing along the internal waterways is now more than three times as great as it was 20 years ago. This increase in the water traffic has taken place, too, in spite of the fact that the extent of the railway system has increased by 69 per cent. in the same period. It is estimated, indeed, that at least 25 per cent. of the whole movement of goods in Germany is effected by means of the canals and rivers, and that the volume of the inland water traffic is now as great as was the whole of the goods traffic on all the German railways put together in the years 1869 to 1871. This is a most remarkable development, and yet there is a strong party in the empire who have been doing their best to oppose a measure calculated to still further extend this beneficent system.

In France, one of the best provided countries as regards internal water communications, this wonderful development of inland navigation in Germany has been watched with interest, and French manufacturers have frequently brought pressure to bear on their government for the adoption of energetic measures for the further improvement of their already excellent system. It is urged that the regulation of the natural waterways should proceed *pari passu* with the making of artificial canals, and the prospects are said to be very favorable for the adoption of this policy, the powers that be having, in recent times, looked with favor upon projects of the kind. The proposal which stands before all others at present is the cutting of a canal to connect the river Garonne with the network of the other French canals. The Rhone, too, it is considered, can be regulated at a relatively small cost, and in the way of new cuttings only requires to be brought into connection with the Loire to increase its value considerably, and no doubt this would be a great boon to the trade of the southeastern portion of France. It is further pointed out that the connecting links by means of the Oise are scarcely commensurate with the requirements of the present day. The programme is altogether a comprehensive one, and perhaps the most important feature in it is the junction of the inland with the ocean navigation, and in this connection the two old and much-debated schemes of a ship-canal to Paris and a deep and wide cutting between the Atlantic and the Mediterranean are receiving renewed attention. The first is thought to offer no engineering difficulties, and to be a mere money question, but the second will be a stupendous enterprise, and opinions are greatly divided as to its practicability. Improved water communications to enable inland manufacturers to forward goods for export at a cheap rate to the great ports such as Havre, St. Nazaire and Marseilles, are also said to be a necessity, and the various chambers of commerce are combining for the discussion and examination of this question. That cheap inland water communication is a matter of supreme importance to an industrial population cannot be denied, and great attention is being paid to it on the continent.

A SIX-MASTED SCHOONER.

A six-masted schooner of 330 feet over-all length with a great spread of canvas is a ship of more than ordinary interest in these days of steam power and sailless tow barges. Capt. John G. Crowley of Camden, Me., is to have such a vessel built this fall, and has just given out particulars of the hull and sail plan. The vessel will be of wood, 300 feet on the keel and 330 feet over all, and will carry 5,000 tons of coal. Her lower masts of Oregon pine will be brought east by rail, and will be 116 feet long, foremast 36 inches in the partners, and the others 26 inches. The topmasts will be 58 feet long, foremast 20 inches in the cap, and the others 17 inches. Her bowsprit will be 35 feet long, and her jibboom 75 feet. The boom of the driver will be 72 feet long, and the others booms 42 feet 6 inches. The driver gaff will be 46 feet and the others each 41. A 4-foot poop deck will run from aft to 10 feet forward of the mainmast. The schooner will have four houses on deck, the forward one 26 feet long, the midship 16, the afterhouse 35, and a roomy wheelhouse. She will be 48 feet beam, 22 feet depth of hold, and will draw about 24 feet of water, loaded. She will be fitted with a double set of pumps, engines and steam winches fore and aft, the pumps capable of throwing 1,000 gallons of water a minute. Her chains will be 2½-inch, 200 fathoms each, and her two anchors will each weigh 7,000 pounds, the chains and anchors being of the same size as those to be placed on board the battleship Kearsarge. She will be fitted with wire rigging.

HILLMAN YARD TO BE REOPENED.

A syndicate of New York and Philadelphia capitalists has purchased the yard of the defunct Charles Hillman Ship & Engine Building Co. at Philadelphia, and, it is announced, will place it in active operation within a short time. The plant purchased is the one which it has several times been reported would in all probability be purchased by the Wm. Cramp & Sons Co., by reason of the fact that it is located convenient to the Cramp dry dock. Names of the persons interested in the purchase have not been made public, but it is understood that the prime mover in the enterprise is Henry Konitzky, general manager of the Columbian Iron Works, Baltimore, Md., and who for several years held a responsible position with the Cramp company and later was hull constructor at the works of the Neafie & Levy Co., Philadelphia. The assignment of the Hillman company took place, it will be remembered, on Dec. 28, 1898, the death of Charles Hillman, its founder and president, having occurred on Dec. 22 of the same year.

AMERICAN BOILERS IN BRITISH SHIPS.

ADMIRALTY OFFICIALS HIGHLY PLEASED WITH THE RESULTS OF AN EXHAUSTIVE SERIES OF TRIALS WITH BABCOCK & WILCOX WATER TUBE BOILERS ON THE GUNBOAT SHELDRAKE.

Trials of Babcock & Wilcox water tube boilers in the British twin-screw gunboat Sheldrake having been finally completed, the vessel has returned to Davenport to be put out of commission. The marine journals of England all report that the admiralty officials express themselves as highly pleased with results attained with these boilers, the first of the type in the British navy. The praises of water tube boilers are certainly being sung in earnest these days. The facts here shown as to economy, capacity and durability are most remarkable.

The Sheldrake was built at Chatham dock yard in 1889, and engined by Maudslay, Sons & Field, with two sets of triple expansion engines of 3,500 indicated horse power, having cylinders 22 inches, 33 inches and 49 inches diameter, with a 21-inch piston stroke. She is 230 feet long between perpendiculars, has a beam of 27 feet, a displacement of 735 tons, and a draught of 8 feet 3 inches. The Babcock & Wilcox boilers with all their fittings and accessories were made by the patentees at their works at Renfrew and replaced old-type naval boilers in the Sheldrake. They are set in pairs in two boiler compartments, divided by a water-tight bulkhead, the boilers being back to back, fired fore and aft, and each having its own stokehold. There are nineteen sections of tubes in each boiler, all of solid drawn steel, galvanized on the outside, those connecting the headers and cross boxes being 1 13-16 inches diameter. The uptake heaters, as shown in Fig. 2, are connected to the steam water drum by 4-inch diameter tubes; down-comer tubes, which are also of 4 inches diameter, being taken from each end of this drum and connected to a wrought-iron mud box provided with blow-off and drain valves, as shown in Fig. 1, the level of the water in the drum being regulated by a Thornycroft feed-water regulator. The total grate surface in the four boilers is 252 square feet and the heating surface 9,424 square feet.

Reference has been made in these columns to some of the trials of the Sheldrake boilers, but a general summary, dealing with the whole admiralty programme, and which is taken from the Engineer of London, will undoubtedly prove interesting. Four 6-foot diameter double-inlet fans, driven by independent engines, and capable of running at 600 revolutions a minute, supply an increase of air pressure in the stokeholds. Each pair of boilers has an independent uptake and one funnel, the latter being 5 feet diameter, with its top 45 feet above the grate bars. For facility of firing, and to prevent too great an inflow of cool air while stoking, each boiler furnace has three fire-doors, which are so hung as to swing well clear of the mouth of the furnace while being fired. The boilers are made for a working pressure of 200 pounds per square inch, reduced at the engines to 150 pounds. They were built under strict survey by admiralty surveyors, and one of them—as per contract—was erected on shore at the makers' works, and subjected to tests by admiralty officials to determine its capabilities and efficiency.

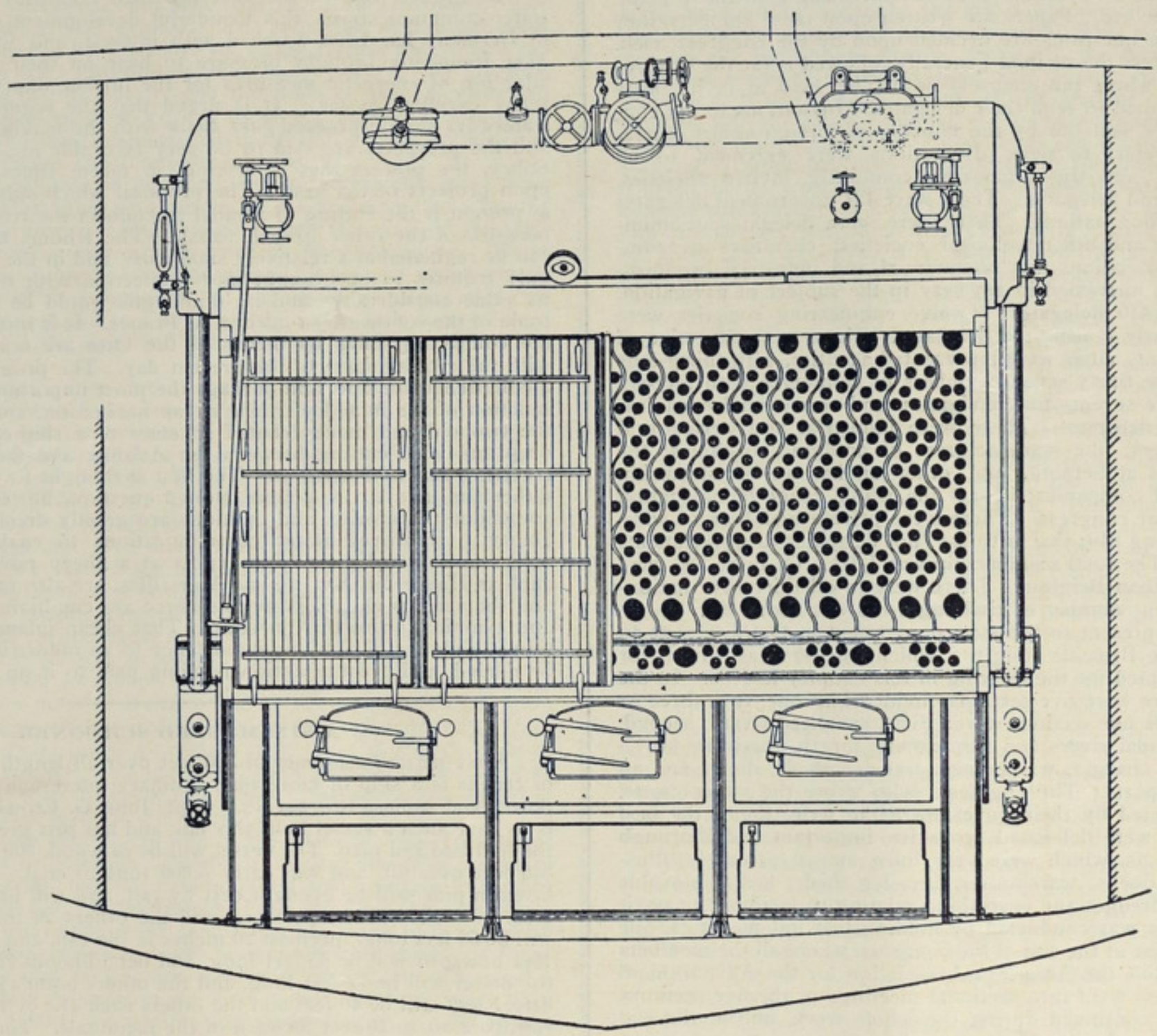


Fig. 1—FRONT ELEVATION OF BOILER

The makers' guarantee was that any one of the boilers steamed on shore would, with Welsh coal and feed water at 110 deg. Fah., evaporate from 11,000 pounds to 12,000 pounds of water per hour with natural draft, and from 18,000 pounds to 19,000 pounds of water per hour with a forced draft not exceeding 3 inches of water, the feed water being the same temperature, viz., 110 deg. Fah. The boiler under test was fitted with a funnel 3 feet 6 inches diameter, and 45 feet high above grate bars, assisted draft being obtained by a steam jet in the funnel, the results obtained showing that with only ¼-inch air pressure in the ash pit for three consecutive hours' run, the water evaporated per hour from a temperature of 70 deg. was 19,577 pounds, equivalent to 20,250 pounds for 110 deg., and the rate of combustion per square foot of fire-grate was 40.7 pounds, the test showing that about 72 per cent. of the heat value of the fuel could be utilized with suitable bars and draft. Trials were subsequently made, one to ascertain the economy at a lower rate of combustion, when 73.5 per cent. of the theoretical heat value of the coal was obtained, and one for the highest economy with the grate area reduced to 54 square feet, and a rate of combustion of 22.5 pounds per square foot of grate per hour, when an efficiency of 81 per cent. was realized, the draft not being assisted in any way.

The first sea trial of the Sheldrake took place Nov. 28, 1898, and was of eight hours' duration, all four boilers being in use. It was a trial for economy, 15 pounds of coal being burnt per square foot of grate per hour. The steam pressure at the boilers was 152.5 pounds per square inch, and an air pressue of .2 inch of water, the temperature of the feed water being 103 deg., and of the steam 366 deg. The power developed by the engines running at 242 revolutions per minute was 2,642 indicated horse power; the speed of ship attained 17.9 knots an hour, and the coal consumption 1.429 pounds per indicated horse power per hour.

On Dec. 1, 1898, a full-power trial was made at sea, all four boilers being in use, the results attained at it being as follows: The average steam pressure maintained in the boilers was 150 pounds per square inch, the air pressure in stokeholds being equal to half an inch of water. The temperatures were: External air, 57 deg.; in boiler-room, 70 deg.; feed water, 110 deg.; steam, 365 deg. The coal—Powell-Duffryn—burnt was 6,462 pounds per hour. With the engines making 280 revolutions per minute, the power developed by them was 4,050 indicated horse power, the average speed of the ship being 20.6 knots per hour. The coal consumed on this trial was at the rate of 1.57 pounds per indicated horse power per hour, the heating surface being 2.3 square feet per indicated horse power, and the indicated horse power per square foot of grate, 16.

The foregoing recorded trials of the Sheldrake took place at the latter end of 1898, and were but preliminary to an exhaustive and interesting series that has just been completed. The vessel was commissioned Feb. 14, 1899, and since that date has gone through a series of nine 1,000-mile runs at various rates of steaming, during which the three after boilers only were used, the fourth—the forward—being held in reserve (cold).

The programme of the trials to be gone through while in commission was: Four 1,000-mile runs with engines developing 1,500 horse power; two 1,000-mile runs with engines developing 1,800 horse power; two 1,000-mile runs with engines developing 2,000 horse power, and one 1,000-mile run with engines developing 2,250 horse power. The first four trials, which were commenced Feb. 28, March 14, April 7, and April 14 respectively, were satisfactorily completed, the economy realized averaging 1.58 pounds of coal per indicated horse power per hour; the weight of coal burnt per square foot of fire-grate being 12½ pounds.

The results attained on the 2,000 horse power runs, which commenced June 4 and July 3 respectively, were a coal consumption of 1.56 pounds per hour, the coal burnt per square foot of grate being 16½ pounds.

On May 5 and June 8 respectively the runs at 1,800 horse power were commenced, the coal consumption during each of them being 1.6 pounds per indicated horse power per hour, and the quantity burnt per square foot of grate 15¼ pounds.

On July 17 the ship left for the ninth and last of the 1,000-mile runs, when the following results were realized: Indicated horse power developed, 2,250; coal burnt per I. H. P. per hour, 1.62 pounds, a weight of 18¾ pounds of coal being burnt per square foot of fire-grate.

At the completion of the 1,000-mile trials some interesting experiments were made directly connected with the boilers. The first was on the forward boiler with the view of ascertaining in what time steam could be raised to 140 pounds pressure from water at 70 deg. Fah.; this was found to be 23 minutes. This was followed by a stopping and starting test—the engines, while going at full speed, being suddenly stopped. The front, tube, and uptake doors were simultaneously opened, and ash pit doors closed, when the rise in the pressure gauge did not exceed 5 pounds; neither did the safety valves lift. A test was then made to see how soon the operation of drawing a tube could be commenced after drawing fires, and how quickly a tube could be taken out of a boiler. To determine the first, when the boiler was working at full power, the fires were suddenly drawn and the water blown out. In twenty-four minutes after drawing fires, several caps were taken off ready for tube drawing. Three tubes were subsequently drawn, one after the other, the first taking eleven, the second ten, and the third nine minutes.

It has been discovered that there are two vessels of the same name in the United States navy. The old wooden cruiser Iroquois is at Port Orchard naval station, while the tug Iroquois is doing government work in Honolulu harbor.

GREAT NORTHERN COMPANY'S BIG ORE DOCK.

The ore shipping dock to be constructed at the head of Lake Superior during the coming winter by the Great Northern Ry. Co. in connection with its ore interests on the Mesabi range, will be the largest structure of its kind in the world. The highest and widest docks now in the Lake Superior district are those of the Duluth & Iron Range and Duluth, Mesabi & Northern roads, with extreme limits of slightly under 60 feet height above water, and width of 49 feet. The longest of these is 2,400 feet. The Great Northern proposes to erect a dock 73 feet high and 63 feet wide, and has let dredging contracts, and is preparing plans for the construction. Its pockets will hold from 300 to 350 tons of ore each, instead of 200 tons, the maximum at present. At first glance it may seem possible to increase the size of a structure of this kind without limit by an increase of material, but this dock will present features that will necessitate a change in methods of construction, and a striking into new lines that may or may not prove successful. The customary price of ore docks of modern size has been averaging of recent years about $1,200 per pocket, and some 30,000 feet, B. M. of timber has been used per pocket. The size and extra strength required of this dock will bring the material up to about 50,000 feet per pocket, and the cost, as near as can be estimated in advance of plans, to not far from $2,000 per pocket. The dock will be 2,100 feet long, and as the width of the pockets is fixed at 12 feet centers by the requirements of the shipping interests, there will be 350 pockets on the two sides. The cost of the whole structure can hardly fall under $700,000, and the timber consumed will be in the neighborhood of 17,500,000 feet, most of which must come from the Pacific coast. Contracts for the dredging have been made and the work begins at once. The bottom at the dock site is muck, and the foundation can scarcely be less than 30 to 40 feet below water level, making a total height from the solid ground to the deck where the heavy locomotives and cars will be run and switched, of from 100 to 110 feet. The floors of the pockets will be laid at an angle of 45 degrees, which is from 6½ to 5 degrees steeper than the usual practice, and will cause the entire weight of the ore to bear on the sides of the pockets. This dock will be built exclusively for Mesabi ore, and this soft ore will slide easier with steeper floors. Five lines of rails will be laid on each side of the top, making four tracks over each pocket. No dock is in use at present that has more than four lines of rail. This dock will have a capacity of more than 100,000 tons of ore, the largest at present being dock No. 2 of the Duluth, Mesabi & Northern, with about 60,000 tons capacity.

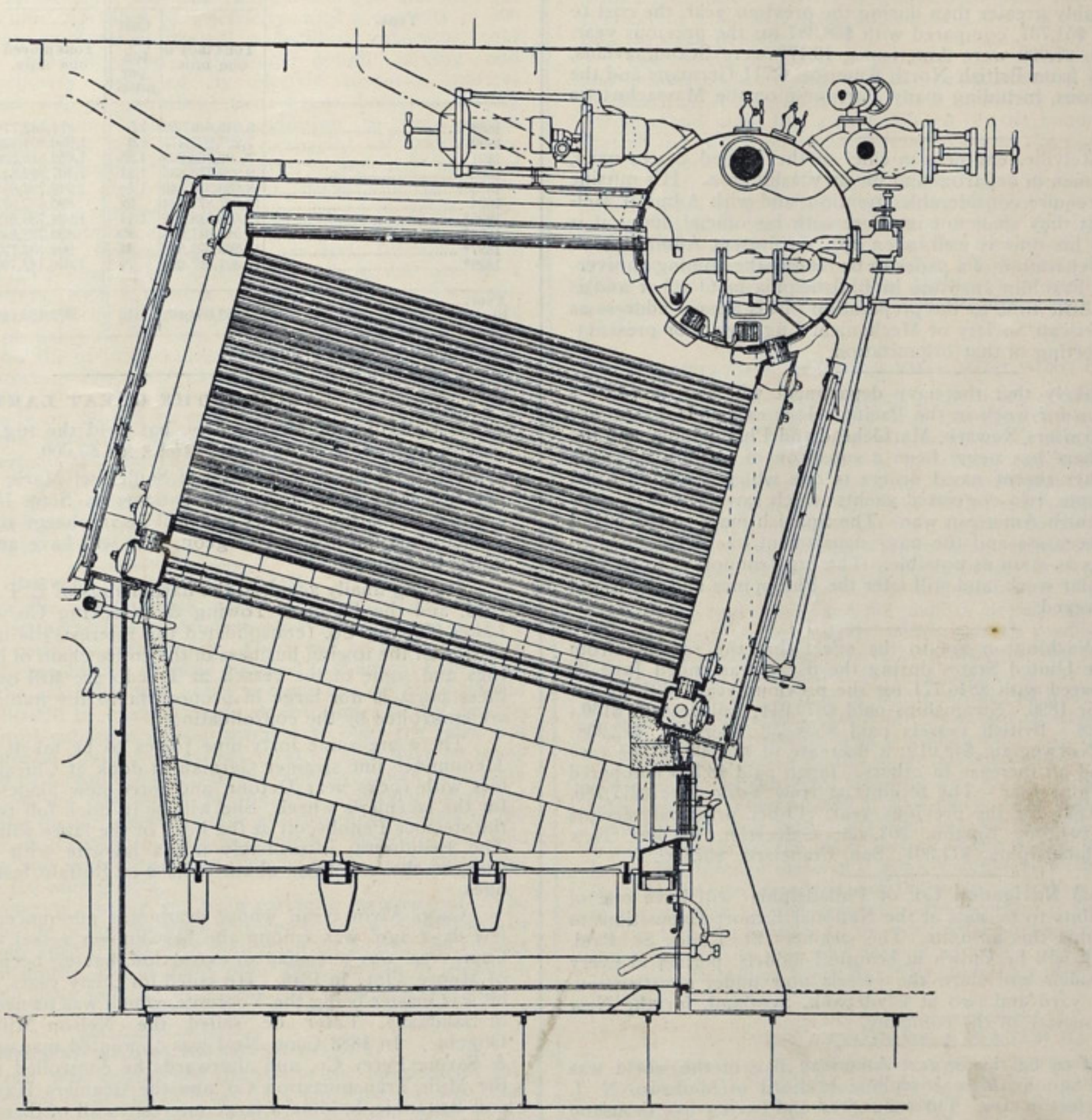


Fig. 2—LONGITUDINAL SECTION OF BOILER

MARINE REVIEW

Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

Published every Thursday at No. 418-19 Perry-Payne building, Cleveland, Ohio, by THE MARINE REVIEW PUBLISHING CO.

Eastern Agents—The Samson Advertising Agency, 102 and 104 Fulton St., New York, N. Y.

SUBSCRIPTION—$2.00 per year in advance; foreign, including postage, $3.50. Single copies 10 cents each. Convenient binders sent, post paid, $1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

Returns received at Washington from all the United States shipping commissioners with the single exception of the official at the port of Norfolk, Va., show that during the fiscal year ending June 30 there were made 75,106 shipments and reshipments of seamen and 45,444 discharges, compared with 72,643 shipments and reshipments and 43,752 discharges for the previous fiscal year. The increase is chiefly at Boston, San Francisco and Port Townsend. While the work of the service was considerably greater than during the previous year, the cost to the government was $51,737, compared with $58,387 for the previous year. Of 75,106 shipments, 27,009 were Americans, 16,177 were Scandinavians, 13,722 British, chiefly from British North America, 6,711 Germans and the balance of other nations, including many Portugese on the Massachusetts coast.

Rear Admiral Melville, engineer-in-chief of the United States navy, is one of the busiest men in departmental life at Washington. His outside duties and interests require considerable attention, and with Admiral Melville's great care that they shall not interfere with his official duties it is easy to imagine that his time is well taken up. At present Admiral Melville is busy in the preparation of a paper to be read at the coming anniversary meeting of the Franklin Institute in Philadelphia in October and is also devoting not a little time to the preparation of his annual address as president of the American Society of Mechanical Engineers, for presentation at the winter meeting of that organization.

It now seems likely that the navy department will shortly form a squadron of evolution for work in the Pacific. It is expected that it will be composed of the cruisers Newark, Marblehead and Philadelphia, and the battleship Iowa. There has never been a squadron of evolution on the Pacific. Among other recent naval orders is one which sends to Cuba the Yankton and Eagle, two converted yachts which saw service as gunboats during the Spanish-American war. The Spanish maps of the island have been found inaccurate and the navy department has determined to rectify these mistakes as soon as possible. The tug Iroquois is to be sent to Honolulu for similar work, and still later the Philippines and the island of Guam will be surveyed.

Reports from Washington are to the effect that the receipts from tonnage taxes in the United States during the fiscal year ended June 30 were $834,087, compared with $846,771 for the previous year, $731,770 for 1897, and $544,255 for 1896. Steamships paid $670,944; sail vessels, $160,615; penalties, $2,528. British vessels paid $528,353; German, $92,938; American, $65,815; Norwegian, $48,019; a decrease of $24,000 in the case of British vessels and an increase in others. Japan paid $3,309 compared with $2,342 the previous year. The receipts at New York were $277,780, compared with $283,827 for the previous year. Other principal receipts were: Baltimore, $64,300; Boston, $64,563; Galveston, $44,098; New Orleans, $67,198; Philadelphia, $71,901; San Francisco, $37,992.

The International Navigation Co. of Philadelphia will have one of the handsomest exhibits to be seen at the National Export Exposition to be held at Philadelphia this autumn. The steamers St. Louis, St. Paul, Paris and New York will be shown in beautiful models, perfect in every detail, and other models will show the vessels now under construction, two at the Cramps' yard and two at Clydebank, Scotland, for the New York and Antwerp service of the company.

What is claimed to be the largest American flag in the world was completed not long ago by Miss Josephine Mulford of Madison, N. J. The flag is 100 by 65 feet in size. Three hundred and twenty-five thousand stitches were taken in making it. Letters commending her patriotic work have been received by Miss Mulford from President McKinley, Secretary Long of the navy department, and General Miles.

The concensus of reports on the recent trials of the Holland submarine boat near New York harbor is to the effect that they were quite successful. In addition to the torpedo tests, the boat was sent over the government course both submerged and awash for over an hour. The vessel averaged a speed of nearly 7½ miles an hour when submerged. The dummy torpedo was fired when the boat was moving and about 4 feet below the surface.

A test was made in the Delaware river recently of the Board automatic bell ringing buoy. The test was witnessed by members of the rivers and harbor committee, a representative of the Canadian government and several marine engineers. The test is said to have been successful. It is claimed that no ordinary interference will stop the ringing of the bell and that the operation of the apparatus cannot be interfered with by the formation of ice in the winter.

The Bethlehem Steel Co., South Bethlehem, Pa., has just constructed a steel shaft weighing more than 10,000 pounds for the steamer E. R. Andrews.

COST OF MOVING FREIGHT ON THE GREAT LAKES.

[*FROM BLUE BOOK OF AMERICAN SHIPPING.*]

During five years past the cost of moving a ton of freight one mile on the great lakes, as shown by war department reports dealing with St. Mary's Falls canal commerce, has been less than a tenth of a cent (a mill), and for ten years past the average has been 1.2 mills. In 1898 it was only seventy-nine-hundredths of a mill. A cost of 4 mills per ton per mile is about the lowest reached on the railways. Comparisons in this regard are made in the following table. Reports of the Lake Shore and Nickel Plate (New York, Chicago & St. Louis) railways have been selected for the reason that costs attending the movement of freight on these Vanderbilt lines are about as low as those of any other lines in the country. It must be understood, of course, that the railroad tonnage is largely made up of local freight, while the freight of the lakes is through traffic, and is composed of but few commodities, all of which are handled in large quantities and on long hauls.

TONS OF FREIGHT MOVED ONE MILE AND COST PER TON PER MILE ON TWO LEADING TRUNK LINE RAILWAYS AND IN VESSELS PASSING THROUGH THE ST. MARY'S FALLS CANALS.

Year.	In vessels passing through St. Mary's Falls canals.		On N. Y. C. & St. L. Ry. (Nickel Plate.)		On Lake Shore & Michigan Southern Railway.	
	Tons mov'd one mile.	Cost per ton per mile.	Tons moved one mile.	Cost per ton per mile.	Tons moved one mile.	Cost per ton per mile.
1889	5,940,646,352	1.5	874,382,713	4.12	1,859,009,822	4.79
1890	7,207,299,415	1.3	1,050,804,339	4.03	2,156,677,869	4.58
1891	7,.92,462,269	1.35	1,052,515,236	4.35	2,168,727,231	4.56
1892	9,222,773,938	1.31	1,107,342,842	4.34	2,435,079,712	4.36
1893	8,980,310,240	1.1	946,792,616	4.78	2,427,692,020	4.61
1894	10,927,871,324	99	896,657,971	4.31	2,196,244,568	4.06
1895*	12,505,548,892	1.14	1,024,736,918	4.09	2,475,757,176	4.10
1896*	13,582,641,886	.99	890,772,263	4.25	2,377,034,118	3.81
1897*	15,969,393,576	.83	904,102,727	4.20	2,473,436,580	3.56
1898*	17,891,597,030	.79	1,046,143,799	4.15	2,771,978,098	3.29
Aver. 10yrs.	10,952,054,492	1.13	979,425,142	4.26	2,334,163,719	4.17

*American and Canadian canals.

AROUND THE GREAT LAKES.

J. C. Miller of Marine City, has sold the tug Thomas Thomson to Martin Golden of Menominee, Mich., for $3,000.

Work on the new hospital at Sault Ste. Marie is progressing rapidly and it will be ready to receive patients by Sept. 15. Two wards will be devoted to marine patients and will be in charge of Dr. Fred Townsend, assistant marine hospital surgeon, who will have an office and dispensary in the building.

Having finally acquired the harbor tugs of L. P. & J. A. Smith, Cleveland, and the Dunham Towing & Wrecking Co. of Chicago, the Great Lakes Towing Co. (consolidated tug interests) is now practically in possession of the towing business of the entire chain of lakes. The Milwaukee tugs and some of the vessels at Toledo are still out, but the business of these ports is not large in proportion to the numerous other ports that are controlled by the consolidation.

There are some forty-nine plates to be taken off the bottom of the Menominee line steamer German in dock at Chicago, as a result of contact with rocks near Detour, and three new blades will also be required for the steamer's wheel. She will be in dock full two weeks. Repairs on the steamer Penobscott at the head of the lakes will also prove expensive. The Penobscott is probably not a favorite with the underwriters just now, as she cost them about $15,000 at Buffalo last fall for bottom damages.

Capt. Alvin Neal, whose death was announced from Port Huron a few days ago, was among the best-known vessel owners of the lakes. Capt. Neal was of Canadian extraction, having been born in the township of Moore, Ont., in 1846. He sailed for thirty years, the first boat of which he was master being the Yosemite, which was owned by Ryan & Johnston of Sandusky. Later he sailed the Nelson Mills, B. W. Arnold and Gogebic. In 1888 Capt. Neal was appointed manager of the Port Huron & Sarnia Ferry Co. and afterwards he controlled the Pawnee Boat Co., the Mills Transportation Co. and the steamers Havana, Sparta, Concord and Britannic, holding a large interest in all of them up to the time of his death. He was fifty-three years of age.

MORE CONTRACTS FOR BATH BUILDERS.

Bath, Me., Aug. 29.—John S. Emery & Co. of Boston, placed a contract with Kelley, Spear & Co. of Bath, Me., during the past week for a four-masted schooner of 900 tons. She will measure 180 feet keel, 40 feet beam and 18 feet 6 inches depth. Work on the vessel will begin immediately, and she will be completed before next January.

Percy & Small, ship builders here, are to build another large five-masted schooner. She will be the largest vessel ever built by this firm.

The voyage of deep sea investigation, upon which the United States fish commission steamer Albatross has just left San Francisco, is certain to prove of considerable importance. Among the localities visited will be the Society, Friendly and Fiji islands and other groups north and south of the equator, the itinerary covering nearly 20,000 miles and terminating at Yokohama in April, 1900. The principal mission of the Albatross will be deep sea dredging, trawling and sounding.

Satisfactory progress is being made with the work of fitting out the new yard of the New York Ship Building Co. at Camden, N. J. The machine shop, 50 by 132 feet in size, has already been completed and the installation of new machinery is well under way.

SEEKING MORE TRANSPORTS.

A strong effort is being made by officers of the transportation bureau of the United States war department to secure additional vessels for service as transports in carrying troops to the Philippines. Officers of the department stationed at Seattle have been directed to inspect the Roanoke and Port Stevens, with a view to ascertaining their availability for such service. Negotiations are also under way for the charter of the steamers Havana and Mexico of the Ward line. The owners of these latter vessels claim that they can reach Manila in thirty-eight days from New York. The vessels have a capacity of 1,500 men each. It is also proposed to utilize the Thomas, Meade and Logan, now being refitted at Atlantic coast ship yards.

The efficiency of the transport service bids fair to be fully maintained in the future and in all probability will be increased rather than diminished. The latest additions made to the fleet are the City of Puebla, Columbia, Charles Nelson, Belgian King and City of Sydney. They will be added to the regular Pacific transport fleet. The large transports Logan, Meade and Thomas, which, as mentioned above, are now being refitted at Brooklyn and Philadelphia, will be models in their design when completed and each will be able to carry an entire regiment. On the main deck will be the quarters for the crew and petty officers, non-commissioned officers, messrooms, shower baths for the soldiers, firemen and crew, a hospital with an isolation ward, operating room and diet kitchen; a meat chopping machine, operated by electricity, with a capacity of 500 pounds an hour; steam cooking apparatus; a distilling apparatus, cold storage room with butcher shop adjoining; dough mixing and coffee grinding machinery, operated by electric motors; quarters for non-commissioned officers' families, two steam launches swung in davits, four new 27-foot lifeboats, in addition to the present outfit, and eight life rafts each with a capacity of twenty-five people. There will be metallic folding bunks, supported by steel tubes, arranged three in a tier, and shower baths and refrigerating apparatus for preserving the fresh meat to be issued en route. The bridge and spar decks will almost entirely be given up to the ship's officers and the army officers. Forward, on the spar deck, there will be a writing room for enlisted men. On the spar deck there will also be a dining room for officers, with a seating capacity of sixty. Two six-pounder rapid-fire guns will be mounted forward on the spar deck and two aft. There will probably be 700 tiers of bunks for the men arranged on the two decks below the main deck, leaving ample room for refrigerating apparatus and stores. The total cost of altering the three vessels will be about $750,000.

There will be ready on Nov. 1 to carry to Manila the first ten regiments of soldiers the following vessels: Puebla, Warren, Columbia, Charles Nelson, Sherman, Belgian King, Hancock, Grant, Tacoma, Sheridan, Glenogle, Pennsylvania, Valencia and Zealandia. The second ten regiments will be transported by the City of Para, Tartar, Ohio, Newport, Indiana, Morgan City, Senator, City of Sydney, St. Paul, Puebla, Thomas, Logan and Meade.

DEWEY NAVAL PARADE.

Arrangements for the naval parade, which is to be a feature of the celebration in honor of the arrival of Admiral Dewey at the port of New York, are being very carefully carried out. There will be at least sixteen warships in the parade in addition to those attached to Admiral Sampson's squadron. Behind the warships will come seventy-five or more yachts and these will be followed by craft of every description. Every participant in the parade must submit a written promise to obey the rules laid down by the committee in charge. Previous naval parades have on many occasions been ruined by a rush of vessels to the objective point, invariably causing confusion, and the committee having the management of the Dewey affair will make the strongest possible effort to have vessels in the line of parade remain in the positions assigned them. Measures will also be taken to prevent any crowding from outside craft. The steamboat Sandy Hook will be the official boat.

The work of preserving order has been carefully mapped out. The police boat patrol and the police launches will lead in the work and will be assisted by twenty-four special tugs with policemen on board; twelve tugs manned by the naval militia, and as many other boats as can be obtained. All the vessels which have permits to parade will carry a small flag of special design.

CONDEMNS ALL SUBMARINE BOATS.

P. Walter D'Alton, who engineered the last of the Nordenfeldt submarine boats, and served in her in 1886 and 1887 until she was lost, condemns without qualification all submarine boats in a recent letter to the London Engineer. He says that the designing and building of submarine boats seems to be a sort of madness with one country after another, the only cure for which appears to be the actual running of the boats so designed and constructed; and then for a season the world is clear of talk of these impossibilities until the next country takes the fit, when the same enthusiasm is displayed, the same nonsense talked, the same mistakes are made, and finally comes the same relegation to the scrap heap of the object of all the hopes and enthusiasm. The submarine boat, with its crankiness, its absence of buoyancy, its danger—to its friends—is impossible as an engine of war, and, as Lord Chas. Beresford said, "is quite useless as a fighting machine, owing to the necessary absence of morale amongst a crew which would be in a blue funk of it all the time." As partially submerged vessels, however, showing what undoubtedly are extremely small targets, and steaming at high rates of speed, boats of the submarine type may, at times, be ugly enemies to face.

A race to which owners of steam yachts will look forward with considerable interest is that which has been arranged between the Kanawha, recently completed by the Gas Engine & Power Co. and Seabury & Co., Consolidated, of Morris Heights, N. Y., for John P. Duncan, and the Marietta, owned by Harrison B. Moore. During the recent cruise of the New York Yacht Club the Kanawha proved herself an exceedingly speedy vessel.

PORTABLE DECK PLANER.

A machine that has proven of great value as a labor saver to those engaged in building and repairing ships is the Portable electric deck planer manufactured by Thos. H. Dallet & Co. of Philadelphia. This machine, which at first glance has the appearance of a freak lawn mower, was designed for planing decks of steamships, but it is equally useful for any large floor space which requires to be smooth planed. It consists of a frame carrying the cylinder and knives and an electric motor for driving same, which is mounted on rollers and furnished with handles, by which it can be pushed over the work.

The frame is made of steel, to gain strength with lightness; the cutting cylinder is a steel forging in one piece, planed true and slotted for the knife bolts; the knives are placed on the cylinder with one end ½-inch in advance of the other end, so that the whole length of the knife does not cut at once but makes a drawing cut, and the rollers on which the frame is mounted are turned true and fitted with hardened steel roller bearing journals, enabling the machine to be pushed easily. The back set of rollers are mounted in the frame in a swinging bracket, held by an eccentric shaft. This allows the rollers to swing back and lower the knives to the work when going forward and to swing in front and under, lifting the knives from the work when going backward; and by adjusting a hand lever attached to the eccentric shaft the depth of the cut can be instantly changed. Power is transmitted from the motor to the cutting cylinder by a flat belt made endless, and there is a tightener and pulley to take up slack in same.

The electric motor is of the dust and water-proof type, very simple and substantial in construction, and being enclosed, is well protected from the shavings and outside injury. It is furnished with a starting switch and rheostat and main line switch, placed on the handle of the machine, so that all the switch levers are in easy reach of the operator's hand when in working position.

The machine can be furnished, when so desired, with an attachment to trim close up to the wall, consisting of a cutter head and shaft, which is put in place of the cylinder after removing the latter, the arrangement being also fitted with a guard to keep the knives from cutting the wall. The planer is made in two sizes—No. 10, weighing 500 pounds, driven by a 5 H. P. motor, which planes 10 inches in width, and No. 15, which weighs 700 pounds, driven by a 7 H. P. motor, and capable of planing 15 inches width.

COMPETITION FOR THE SHIP BUILDING CONSOLIDATION.

As might have been expected, there are a couple of projects now under way that will probably offer competition to the consolidated ship yards of the great lakes; not on a large scale, of course, but in an important way as regards repairs of both steel and wooden vessels. One of these is the purchase of the Mills dry dock plant at Buffalo by interests that will very probably represent both vessels and underwriters. It is understood that an opinion has been secured on the Buffalo plant and that a company is being formed with sufficient capital to undertake important improvements. The Mills dry docks—there are two of them—are small but there is sufficient ground space to construct one dock capable of taking in a 500-foot vessel, and the plant is already equipped with some tools for the repair of steel vessels, which may be readily increased. At West Bay City all arrangements have been made for the construction of the new Davidson dry dock, which is to be ready for the opening of navigation next year, and which is to be 500 feet long, with 60 feet width of gate and 15 feet over miter sill. Tools for the repair of steel vessels will undoubtedly be put in when this dock is completed.

The construction of this dock at West Bay City will very probably cause the American Ship Building Co. to go slow about entirely dismantling the Wheeler yard at that place. The Wheeler plant really consisted of two ship yards, or rather two parts. One of these departments was removed from the main portion of the works, entailing extra expense in the handling of material. Some machinery from this part of the plant has already been removed, but the main portion of the works will be left intact, at least for the present. This decision is probably prompted also by the fact that officials of the consolidation seem to think well of Superintendent Jeffries and may deem it advisable to keep up the organization that was effected at West Bay City under his direction after the Wheeler failure.

INVENTION OF A WATER GLASS.

M. Dibos, a French marine engineer has invented what he calls an "elbowed water glass" which is designed to obviate the difficulties caused by refraction when locating lost anchors, patches below the water line, etc. His invention is a sort of large lorgnette, and annuls the effects of refraction. It is composed of a zinc tube of elliptical section, the ellipse being 20 centimeters at the greater axis and 16 at the smaller axis. The tube is open at the top, and toward the lower end is closed by a small glass without foil; but at right angles to the tube is fixed, at 45 degrees, another little glass, silvered. The tube, held by two handles, is used on board ship like a telescope, and with the bent end directed toward the part of the ship to be examined. The observer, by putting his head into the upper opening, receives the rays of light refracted by the glass and perceives the object in front of the tube most clearly. In default of sufficient daylight, or at night, an electric glow lamp can be let down near the elbow, or rays can be cast on it from the focus of a reflector. With a tube sufficiently long the operations of divers can be watched from on board to see that no harm comes to the men. In this case the tube has to be weighted with lead.

There are rumors of a transfer of the plant of the Babcock & Wilcox Co. from Elizabethport, N. J., to Bergen Point. The property which may be purchased as a site for the works extends for more than 800 feet along the Kill-van-Kull water-front, and the prices asked for it is said to be $300,000. It is stated that if the company purchases the site there will be erected thereon a number of fire proof buildings, the aggregate cost of which will be in the neighborhood of $1,000,000.

COMPETITION FROM AMERICA.

ENGLAND FEARS THE ADVENT OF THE UNITED STATES INTO THE OVER-SEA CARRYING TRADE. AS THE WEALTH AND MECHANICAL SKILL OF OUR PEOPLE WOULD GO WITH S UCH A MOVEMENT.

Some of the best authorities in matters relating to England's shipping interests have on numerous occasions of late expressed the conviction that the ship builders and ship owners of the United Kingdom are likely to find ere long in their American rivals competitors of greater energy and ability than any which they have met heretofore. These admissions are all but superfluous, however, since the whole tone of current comment in British engineering journals eloquently attests the existence of such a feeling. Many of the observations made on this score are interesting in the extreme. Particularly is this true in the case of a recent editorial in the Syren and Shipping, one of the best-known marine journals of London. The article is written, of course, from the standpoint of the Britisher who sees in "free ships" the only possible salvation for his interests, but incidentally there is under cover full evidence that the Britisher fears competition for his ships from America, even though congress may do nothing in the way of legislation favorable to vessel interests. The article referred to is as follows:

"During the fiscal year ended June 30, 1899, the output of new shipping from United States yards exceeded that of any year since 1874, if we except the tonnage constructed during 1891. Although this shows the American ship building industry to be progressing, the totals concerned are but trivial when compared with the new tonnage constructed in British yards. During the year 1898-9, some 1,429 vessels of 320,876 gross tons were built at American yards; for the year ending with June 30, 1891, the output was 369,302 tons, the biggest total of the past quarter of a century. The average size of this new shipping was small, being only 225 tons, against over 900 tons, which was the average size of the vessels built in the British islands. A noteworthy feature of last year's American ship building lies in the fact that a much larger proportion than usual was constructed for over-sea work—not for employment on the great lakes or in the coasting trade. The Havana and the Mexico were built for the mail service between New York and Cuba; while four other vessels were built for the Admiral line, and will be engaged in the Cuban and Jamaican trade. In addition to the new tonnage added to the United States mercantile marine during the past fiscal year, twenty-two vessels of 30,182 tons, all of which were built abroad, were transferred to the American flag. These craft were either captured from the Spaniards, or were bought to strengthen the transport service.

"But it is not so much the present position of the United States mercantile marine as its future which concerns British ship owners and ship builders. The average citizen of the North American republic is convinced that colonial possessions warrant a mercantile marine, if nothing else does. And along with this spur to enlargement of the United States merchant shipping fleet is the equally potent factor of a huge export trade conducted almost exclusively in foreign bottoms. Thus, during the year under review, 23½ million tons of shipping engaged in the foreign trade entered American ports. This total may be classed as follows:

British	13,000,000 tons.
Foreign	5,000,000 "
American	5,500,000 "
Total	23,500,000 "

"Naturally, therefore, so 'patriotic' a people as are the inhabitants of the states regard with dissatisfaction the sea-carriage of the cargo they themselves find in foreign bottoms. They would gladly see the Stars and Stripes flying over a larger number of vessels engaged in conveying American produce to the markets of Europe. Against the realization of this wish there are two obstacles to be overcome. The first is the navigation laws, which debar an American citizen from ordering tonnage abroad or buying foreign ships; and the second lies in the fact that the building of steel vessels is an economic task, which only a lengthy training can render successful on anything like a large scale. So far as the first of these disabilities is concerned, it is not to be expected that a state committed to protection will so far go back on past methods as to pass a free ships bill. It is impossible to conceive a republic which levies heavy duties, sometimes prohibitive, on importations of almost every description, putting such complex and costly structures as ships on the free lists. More probable is it that the American legislature will seek to assist their native ship builders by bounties paid to ship builders for tonnage constructed. Possibly, they may even go further still, and grant bounties to all ship owners who engage in the foreign trade. Such, indeed, seems to be the prevalent opinion in United States commercial circles. At the same time, it is well to recognize the fact that, premising American ship owners, *in esse* or *in posse*, are willing to pay a good price for their ships, there is but little need for the legislature to pick the public pocket to subsidize native ship builders. If the steel manufacturers of the United States can produce steel plates at such a price as will enable them to export to Glasgow and undersell the Scotch ironmasters in their own market, it is obvious that ship building material must be cheap—in fact, very cheap—to native ship builders. Whether the American merchant realizes this, or whether he is depending upon congress passing an over-sea subsidy bill for the benefit of domestic shipping we cannot say; but it is certainly significant that already 100,000 tons of steel shipping have been contracted for, involving an outlay, it is stated, of $14,000,000 or $15,000,000.

"This is quite sufficient to prove that America's competition in our over-sea carrying trade will, in the near future, become more live and real than it has been in the past. It is somewhat surprising, considering the tendency which the American commercial mind has to adapt itself to the combination of colossal capitals for the exploitation and the development of certain industries, that more attention has not been paid to ship building. The same organizing skill and mechanical aptitude which have made for the success of United States manufacturers, should by this time have given the United States a mercantile marine worth the having. Fortunately for English ship owners, however, ship building became an almost lost art in the states after the navigation laws were passed. The history of this barbarous piece of legislation is a striking example of crass stupidity and failure to recognize the true trend of a nation's industrial trade. Years ago, when wood was the chief material used in the construction of ships, the United States ship yards had achieved a well-deserved reputation for excellence of design and workmanship. Her wooden ships were things of speed and beauty which this iron age can hardly equal, but a memory of which yet survives in beautiful lofty-sparred ships, still occasionally seen in British ports. When iron, however, superceded wood, and the Maine ship builders found their business fast declining, congress was requisitioned to prevent the American ship owner from going abroad after iron vessels, and thus, while an astute American legislature was seeking how to conserve a decadent industry, the English ship owner, with his iron ship, became master of the situation. This is now recognized, in fact, has been recognized for some years past; but as it is hard for a country deep-dyed in protection to admit the fallacy of its policy, even in a single instance, the ukase against admitting foreign-built shipping to the American registry is still maintained. And so far as the future of the British ship owning industry is concerned, it is to be sincerely hoped that congress will continue to perpetuate the short-sighted and stiff-necked policy which has now the sanctity of long continuance to recommend it to the American citizen. What the English ship owner, however, has to face is the possibility, or rather the probability, of such assistance being given to the American ship builder or ship owner as will call into being a fleet of ships likely to prove serious competitors with us for the carrying trade of the ocean. The British owner, in his onward march, has often had to face state-aided competition, but there is no disguising the fact that the advent of the United States into the over-sea carrying trade on a scale commensurate with the wealth and mechanical skill of its people, will be far and away the most serious competition he has yet been called upon to meet. Still, he is more ready to face such a rival than he has been at any time during the past half century. Trading to the North Atlantic ports are big fleets of up-to-date cargo carriers, the organization and control of which implies wide-reaching ramifications in both continents. Thus the American ship owner of the future has to face a condition of the freight market, not as it at present is, but as it might, and probably would be, did the British owner resolve upon a rate war as the best means of crushing an interloping rival."

OPPOSITION TO BOARD OF CONTROL.

Considerable opposition seems to have developed in naval circles to the idea of a board of control, the formation of which, according to certain Washington newspaper correspondents, is proposed as a solution of the frequent clashes of authority resultant from jealousies in bureau administration. In discussing the matter the Army and Navy Register says editorially:

"There has been a great deal said in the newspapers about a naval board, the function of which shall be supervisory of the board composed of bureau chiefs and advisory of the secretary of the navy. The urgent necessity of such a body, according to advocates of its formation, resides in the insurance it is supposed to offer against controversies of a technical nature and the interruption of departmental business. Were this assured by the so-called board of control—admitting that differences of expert opinion clog the government transactions—it would be a desirable institution. There is no assurance, however, that a board of control, no matter how it may be dignified by a composition of high-ranking officers, will settle disputes or effectually dispose of technical controversies. The contentions made by bureau chiefs in favor of certain types, ideas or systems are not likely to be dismissed by the review made by a higher board. We question whether a board of control would serve any practical purpose or facilitate departmental business. After all its consideration of knotty problems, the questions would finally, as now, go to the head of the department. It seems to us the operations of a board of control would simply add to the complex machinery of the government. It would delay important matters and defer action on subjects; it would add to controversy without the compensation of securing wiser disposition of a question.

"The present system of discussing naval construction and design in hull, machinery, ordnance and equipment appears to us to be ample. If there be possibilities of readjusting the duties and responsibilities of bureaus such amendment may be easily accomplished by departmental revision of the regulations. If there be a necessity for abolishing bureaus, consolidating some of them, or establishing new ones, this can be done by an appeal to congress, which will undoubtedly approve any recommendation made by the secretary of the navy as a result of his observations, experience, and the advice given him. If reform be necessary or practicable in the disposal of naval business it is likely a simple action by the head of the department would effect it without the introduction of a new board of officers. A board lacks the responsibility of an individual, and it is a natural incident that the decision of a board is sometimes a matter of compromise. This, of course, need not be so in the case of the projected board of control, but it does not seem, from any present promise or from any of the arguments of those who favor an additional board, that the existing board on construction, composed of bureau chiefs, fails to offer all that is capable by a board of control in the way of advice. It is certainly complete in the chance it gives of the discussion of technical subjects. If there be defects in its organization or methods, the surest and easiest remedy is not by creating a board of control."

The German cruiser Geier will arrive at San Francisco in the near future for the purpose of going into dry dock. It is also reported that three of the smaller German vessels, having on board cadets, will shortly visit Annapolis and other Atlantic ports for the purpose of enabling the young men aboard to get an idea of American naval methods.

TRADE NOTES.

A large marine vertical engine, 30 by 30 inches, non-condensing, is offered for sale at a bargain elsewhere in this issue. Address Box 7, Marine Review Pub. Co., Cleveland.

What should prove a very successful auxiliary in the advertising line is a sixty-four-page catalogue, recently published by the Joseph Dixon Crucible Co. of Jersey City, N. J. It is a model of typographical neatness, profusely illustrated and well bound in a colored flexible cover. It describes everything manufactured by this firm from graphite lubricants to the school boy's pencil.

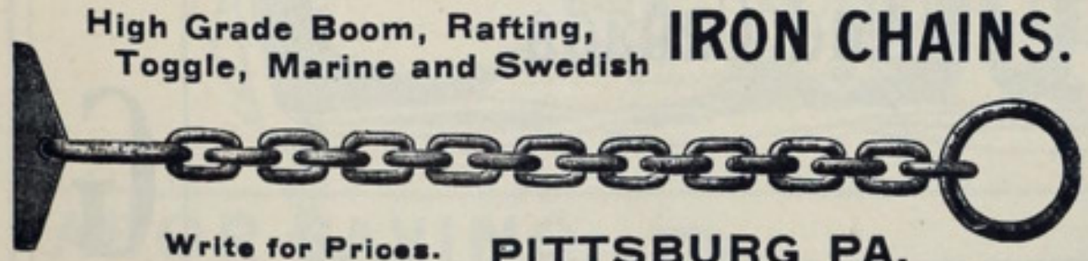
The Kenney flushometer, that ingenious little mechanical appliance for flushing water closets, and which effectually dispenses with the noisy and dirty overhead tank, has in competition with other devices for the same purpose carried off the palm with Wm. Cramp & Sons, Philadelphia, and the Morse Iron Works, New York. The former installed seventy-seven Kenney flushometers on the United States transport Thomas and the latter sixty on the transport Logan. The Kenney Co., manufacturers of this device, are located at 72-74 Trinity Place, New York City.

The steam yacht Josephine, built by the Neafie & Levy Ship & Engine Building Co. of Philadelphia, for Mr. P. A. B. Widener, is painted with Japan paints, manufactured by John Mair & Son of 136 Delaware avenue, Philadelphia. The steam yacht Ibis of Boston, as well as several large steamers and tow boats on the Delaware river, also use this paint. As evidence of satisfactory results on the Josephine, it may be noted that the manufacturers recently filled an order for a large quantity of the paint to be shipped to the vessel at Newport, R. I.

As showing the success achieved with the new Boyer long-stroke hammer, the Chicago Pneumatic Tool Co. reports that one of these hammers was put in use at the Pressed Steel Car Co.'s shops, Pittsburg, at noon Monday, August 21, and has been running continuously day and night up to this time, very rapidly and successfully, driving 7/8-inch rivets and with no breakage or stopping. Expert riveters are not required in using these hammers, and in view of this fact, together with the large amount of work done and the continuous operation of the tool day and night, the report regarding the Pittsburg performance is certainly remarkable.

A. Wells Case & Son of Highland Park, Conn., manufacturers of the Case patent outward thrust propeller wheel, write the Review as follows: "We were a long time gaining recognition for our wheel but business is booming now. The advertisement in your journal has brought us a great many orders. Probably the best advertising policy to follow in the lake region is to advise that vessel owners investigate and make inquiry of those who know of the value of the wheel. Our wheels will be found on the Detroit yachts Sea Fox, Bonita, Truant and Dawn. Reduction of vibration and gain of speed was guaranteed on all these boats. The conditions were more than met and the wheels paid for."

Hydraulic jacks of every conceivable size and form are illustrated in a catalogue just issued by the Watson-Stillman Co. of 204-210 E. Forty-third street, New York. This company's catalogue, consisting, as it does, of nearly 500 illustrated sheets, and covering machinery for a great variety of purposes, is found too large and varied for general distribution, so they have prepared a series of subdivided catalogues, among which is this list of hydraulic jacks. The selection comprises such sheets as refer to jacks and lifting tools generally, and there is included also a few miscellaneous tools, which will be of interest to jack users. These tools are all thoroughly guaranteed in every particular, and the greatest possible care is used to make them absolutely safe and reliable. The Watson-Stillman Co. makes a complete line of high-pressure hydraulic tools for all purposes. Upon receipt of 5 cents in postage this list of jacks will be forwarded to anyone interested.

JAMES McKAY & CO.
Manufacturers of all kinds of
High Grade Boom, Rafting, Toggle, Marine and Swedish IRON CHAINS.

Write for Prices. PITTSBURG PA.

THE PAINT WONDER!
Constructors of Docks or Vessels who want a truly effective paint for coating interior surfaces, ribs, frames, bulkheads, double bottoms, butt straps, seams, outer plating, ceiling or any exterior structural work will do well to investigate our claims.
PYRO PAINT is guaranteed to be fire, water, rust, rot, acid, alkali, brine, worm, insect and barnacle proof. Ask us to prove these assertions by sending you a sample can for $1, together with full information, price list, etc.
MADE ONLY BY
THE SHEARER-PETERS PAINT CO.
C. WILFORD PETERS, SUCCESSOR,
CINCINNATI, OHIO, U. S. A.

THE RUSH'S TOWING RECORD.

A most remarkable performance in towing is credited to United States revenue cutter Rush, which recently towed from San Francisco to Alaska the Naniwak, designed for service in Alaskan waters, where light draught is an essential requirement in all vessels. Something of the perils of the trip to Alaska for a boat of this character may be imagined when it is stated that fully thirty of them have been lost while attempting to make the passage within the past two years. This fact, together with the further circumstance that the Rush was not fitted for towing, has added materially to the satisfaction of the officers over safely accomplishing the trip of 4,200 miles.

.....

According to a report which Capt. W. H. Cushing of the Rush, has just submitted to Capt. Shoemaker of the revenue cutter service, the Rush left San Francisco May 2, and got about 300 miles to northward when she caught a nor'wester. This was the Naniwak's weak point, end on, as she has no knees or heavy timbers in her, and was like a long frame building picked up and put in the water, and called a boat. The sea worked the oakum out of her bow and side seams. Her crew could not get their steam pumps to work, and signaled they could not hold out much longer. Capt. Cushing ran her back a hundred miles, and got her in over Humbolt bar, where she was hauled out on the beach. After twelve days' most disheartening work, having to work in tides and in the mud, not able to see her bottom, and doing what patching they could from the inside, she was floated and towed to Seattle. After a long wait there she was started on June 10, and stopped at Port Townsend, where the men were paid off. At that point Engineer Wood was taken ill, and had to go to the hospital. In Bering sea there was nothing but bad weather for 750 miles, and on the 10th the tow struck a heavy southwest blow, and on the 11th a gale from the northwest, with a heavy cross sea, which necessitated heaving to for twenty-four hours, and rigging out spars fore and aft with oil bags, so that in a little time the Naniwak was in a sea of oil. This was all that saved her. To see those seas strike her and straighten out a 12-inch hawser like a string was no joke, Capt. Cushing says. However, with constant vigilance and over sixty gallons of oil, she was pulled through it all right without any material damage. She did not alter her shape any, which is most remarkable, as all the boats that have been sent up there are hogged or their lines are very wavy, and they had to put on considerable repairs on arrival.

DEVICE FOR COALING VESSELS AT SEA.

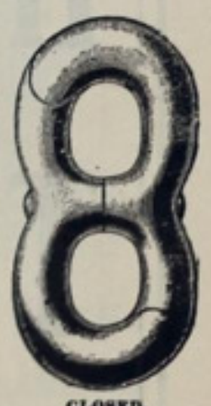
The Lidgerwood Mfg. Co. of New York, whose hoisting engines and cableways are well known throughout the United States, has constructed a special form of cableway adapted for coaling vessels at sea, in which the navy department has shown considerable interest. A contract has been entered into between the navy department and the Lidgerwood company to equip the collier Marcellus with one of these sea-coaling cableways, and a board of naval officers will try the device at sea. Acting Secretary Allen has ordered the Marcellus to be towed from Norfolk to the New York navy yard, and upon the arrival of the vessel, the Lidgerwood company will immediately install their apparatus. The work of the installation will be under the direction of Naval Constructor Bowles.

In this device the warship may take the collier in tow, or the collier may take the warship in tow, leaving a space between the ships of 300 feet. Elevated cables, leading from the mast head of the collier to shear poles on the warships, serve to support and propel a carriage, from which hang bags of coal. The coal is elevated from the deck of the collier, transferred to the carriage at the mast head, and propelled across the intervening space at a speed of 1,000 feet per minute. The arrangement for compensating for the lurching of the vessels in seaway is exceedingly ingenious, and having been tested on a small scale, leaves little doubt as to the working of the appliance at sea. Coaling can be carried on while the ships are moving ahead.

HANDSOME RIVER STEAMER.

The past few months has seen the addition of several very handsome steamers to the fleet now in service on the inland rivers of America. One of the more noteworthy of these is the vessel now building at Paducah, Miss., for Capt. L. Brunner, and which the owner has decided to name in honor of Capt. Fred A. Blanks, with whom he was associated in business for many years. The new vessel is almost an exact duplicate of the old steamer Ouachita, which she will replace on the route between New Orleans and Monroe. She is 190 feet long, 38 feet wide and 6½ feet depth of hold, and will have a carrying capacity of 900 tons, which will enable her to provide space for 3,500 bales of cotton. The new vessel will be modern in equipment in every particular, being fitted with an electric lighting plant, steam steering gear and other improvements.

The Nickel Plate road offers special low rates to Scranton, Pa., account letter carriers convention. Tickets available Sept. 1, 2, 3 and 4, good returning until Sept. 12 inclusive. Inquire agents of the Nickel Plate road for further particulars. 118, Sept. 4.

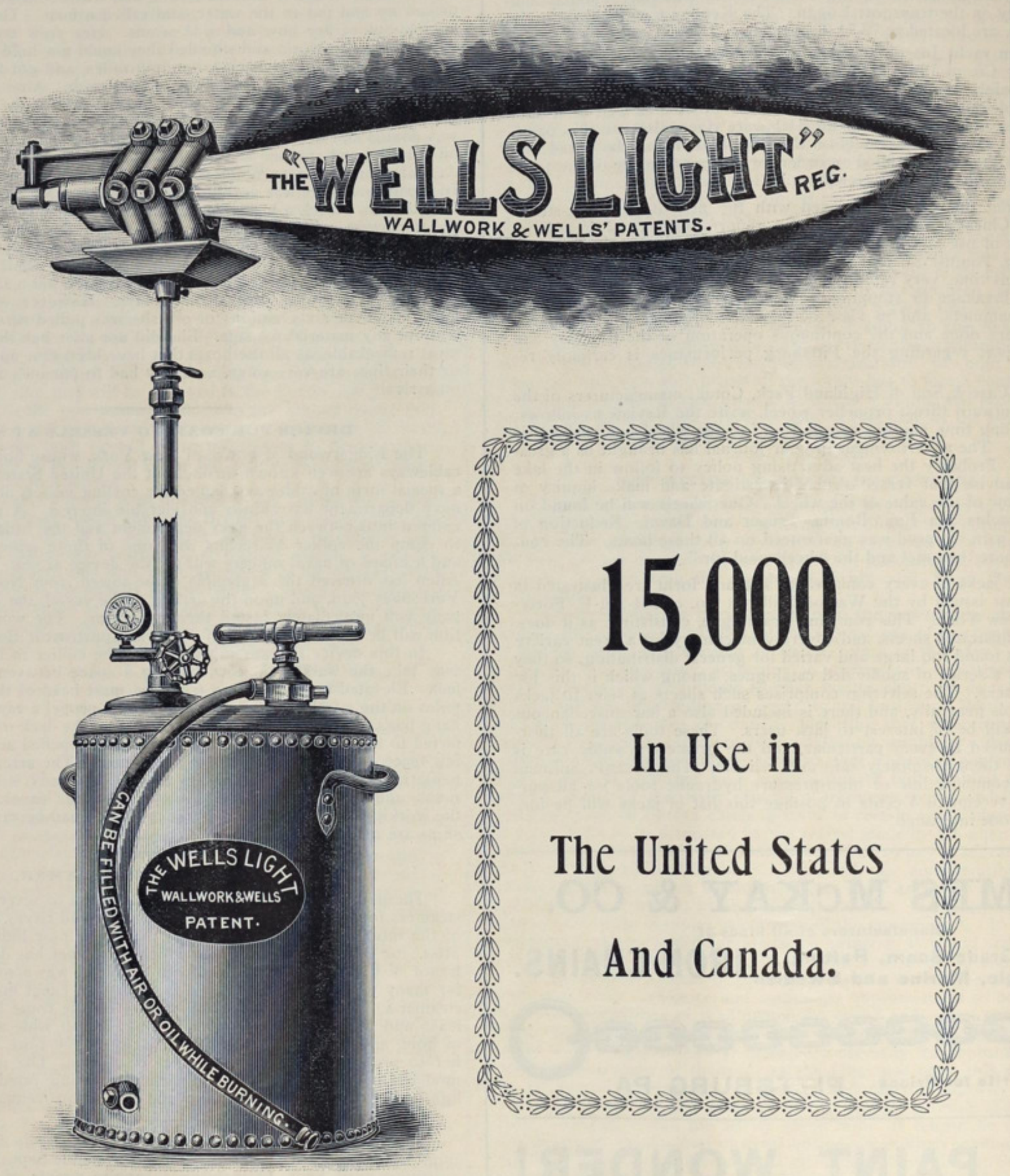
OPEN.
"KEYSTONE" OPEN LINK.
IT IS THE ONLY OPEN LINK ON THE MARKET THAT IS
DROP FORGED FROM BAR STEEL.
For STRENGTH, DURABILITY and SIMPLICITY
IT STANDS WITHOUT A RIVAL
Sizes from ¼ in. to ¾ in.
KEPT IN STOCK
STANDARD Wrenches, Hoist Hooks, Eye Bolts, Shafting Collars, Machine Handles, Thumb Nuts, Thumb Screws, Rope Sockets and Swivels, Fence Ornaments, Bicycle Forgings, &c.
SEND FOR CATALOGUE AND DISCOUNTS
SPECIAL FORGINGS TO ORDER.
KEYSTONE DROP FORGE CO.,
19th & Clearfield Sts. PHILADELPHIA, PA.

CLOSED.

WELLS LIGHT

HAS BECOME THE

STANDARD

WITH DOCK AND BRIDGE BUILDERS, COAL SHIPPERS, DREDGERS, FOR RAILROAD CONSTRUCTION, SHOVELS, QUARRIES, CONTRACTORS, WATER WORKS, &c., &c.


"THE WELLS LIGHT" REG.
WALLWORK & WELLS' PATENTS.
THE WELLS LIGHT
WALLWORK & WELLS
PATENT.
CAN BE FILLED WITH AIR OR OIL WHILE BURNING.

15,000

In Use in

The United States

And Canada.

PORTABLE, SELF-CONTAINED, AUTOMATIC.

Unaffected by Weather. Made in all sizes—800, 2,000 to 4,000 Candle Power from Kerosene Oil.

THE WELLS LIGHT MANUFACTURING CO.,

46 WASHINGTON STREET,

EDWARD ROBINSON, Sole Proprietor. NEW YORK, N. Y., U. S. A.

VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.

Quotations furnished by HERBERT WRIGHT & Co., Cleveland, date of August 30, 1899.

NAME OF STOCK.	OPEN	HIGH	LOW	CLOSE
American Steel & Wire.....	57¾	58½	57⅝	58½
American Steel & Wire, Pfd.....	98¾	.....	.....	98¾
Federal Steel	59¼	61¾	59	61¾
Federal Steel, Pfd.....	82⅜	82⅞	82	82⅞
National Steel	55¾	56¼	55¾	56¼
National Steel, Pfd.....	.....	.....	.....	.....
American Tin Plate	43¼	43½	43	43½
American Tin Plate, Pfd.....	.....	.....	.....	.....
American Steel Hoop.....	39	39¼	38¾	39¼
American Steel Hoop, Pfd.....	84	84½	84	84½
Republic Iron & Steel	26¾	28⅛	26¾	28
Republic Iron & Steel, Pfd	77½	78¼	77	77⅞

Day-light excursion to Niagara Falls via Nickel Plate road on Tuesday, Sept. 5. Train leaves Cleveland at 5:35 a. m. Tickets good returning until the 9th inclusive. For rates and time of departure of special train at intermediate points inquire agents. 125, Aug. 31

Information received by the navy department shows that the subject of patent anchors is having the attention of French naval authorities. Experiments conducted recently give data upon which to formulate the conditions under which the ground tackle of a war ship should be proportioned. One of the most important facts ascertained is that the old fashion anchor has greater holding power than any of the so-called patent anchors. The main reason for the adoption of the patent anchor is strictly a military one. The new style anchor offers less interference to the free bow fire of the great guns and for this reason it is used. The old-style anchor, when correctly proportioned to the ship for which intended, will hold the ship in bad weather until the chain parts. The disaster at Samoa in 1889 was, to a large extent, due to the use of the patent anchor by the three German ships lost on that occasion. All of the vessels recently built, or being built for the French navy, will carry the new style anchor. In the design of the vessels allowance is made for an anchor recess in the bows which will be closed by a port. A report received at the navy department shows that during the recent visit of the northern squadron to Cadiz the battleship Courbet swung over her anchors and the upper fluke of one of them tore a hole in the double bottom.

According to the weekly statement of the bureau of navigation, treasury department, the steam yacht Alberta, recently launched at the Roach yard, Chester, Pa., is of 259 gross or 151 net tons. The steamer Britannia, building at the yard of the Maryland Steel Co., Sparrow's Point, Md., is of 249 gross or 156 net tons.

A SPECIALTY: TOWING LINES AND SHIPS' HAWSERS

ROPE

THE AMERICAN MANUFACTURING CO.

67 WALL STREET, NEW YORK.

THE LARGEST MANUFACTURERS OF FIBER IN THE WORLD.

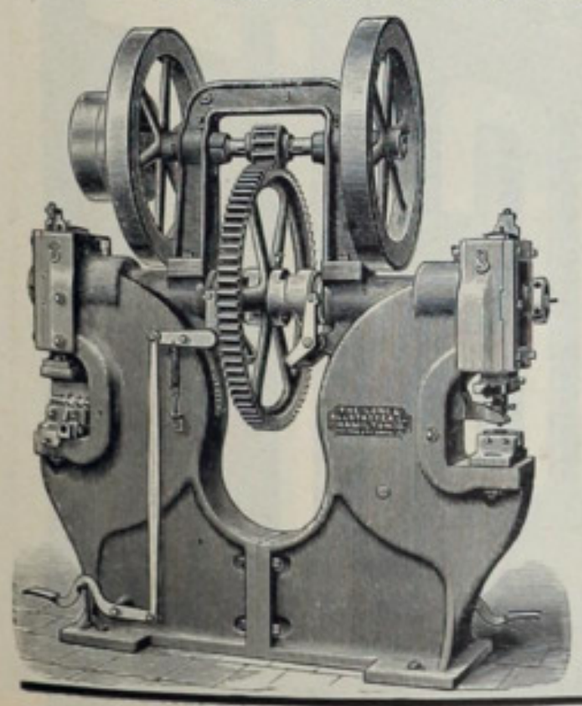
A SPECIALTY: 4-STRAND PLUMBAGO HEART HOISTING ROPE FOR CARGO FALLS

A MODEL OF SIMPLICITY!

PNEUMATIC TOOLS FOR ALL KINDS OF WORK

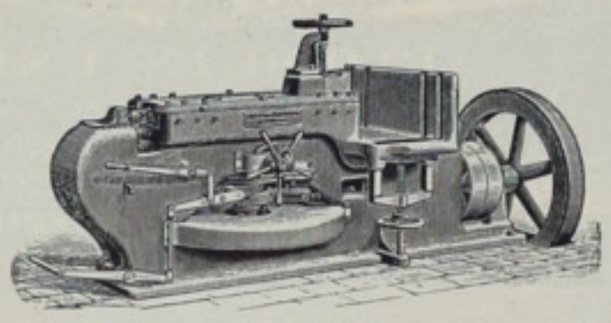
CC Co. CHICAGO - NEW YORK

LABOR-SAVING



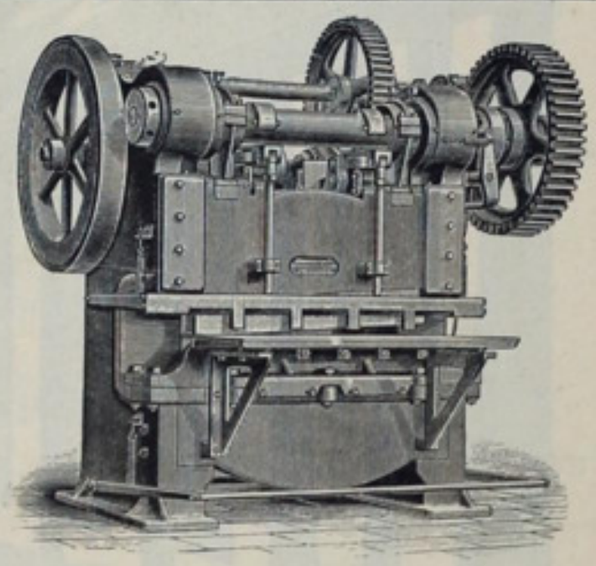
PUNCHES

NEW CATALOGUE NOW READY.



MANUFACTURED BY

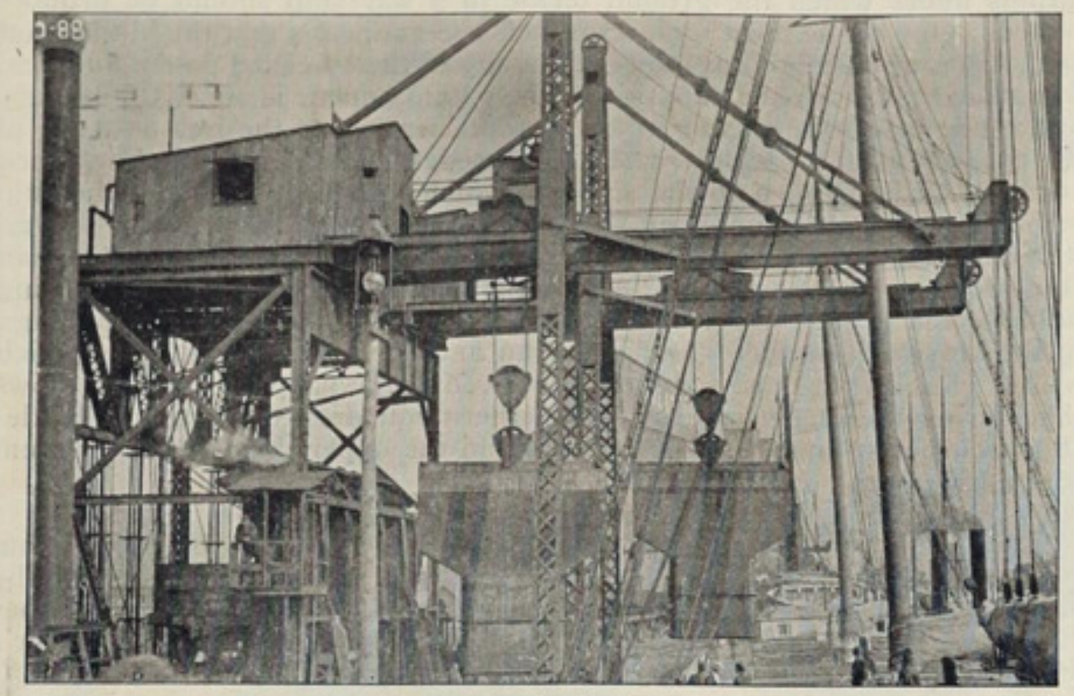
SHEARS



For All Kinds of Work.

THE LONG & ALLSTATTER CO., HAMILTON, OHIO.

WEBSTER, CAMP & LANE MACHINE COMPANY



AKRON, OHIO, U. S. A. { Cable Address "Webcampco." A. B. C. and Lieber's Codes.

Coal and Ore Handling Machinery

OF ALL KINDS, FROM LATEST DESIGNS.

General Mining Machinery, Hoisting Engines.

Hulett Patent Car Dumping Machine.

AIR COMPRESSORS

Rock Drills, Coal Cutters, Air Lift Pump and Stone Channellers.

THE INGERSOLL-SERGEANT DRILL CO.,

CATALOGUES. Havemeyer Building, NEW YORK.

...THE...

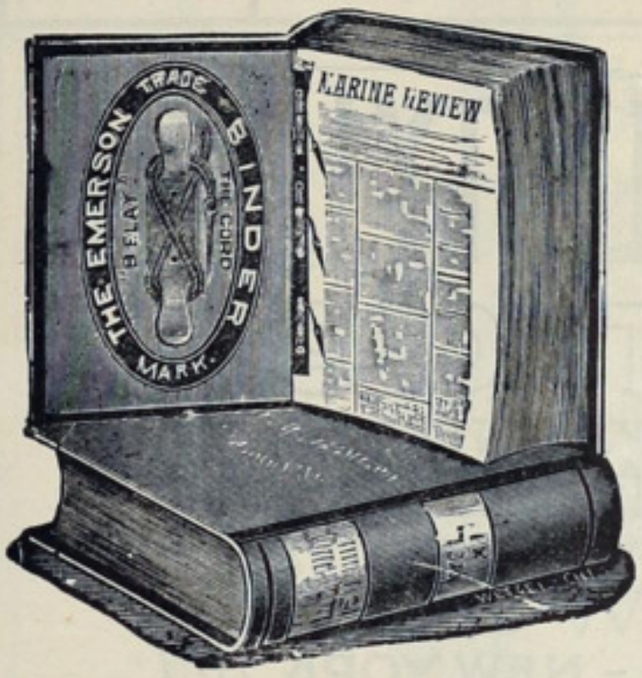
BERLIN IRON BRIDGE CO.,

Engineers, Architects and Builders of Steel Structures.

Office and Works EAST BERLIN, CONN.

Names and Addresses of Naval Architects,

Ship and Engine Builders, Vessel Owners, and in fact everybody connected with shipping interests, together with full statistics of the United States merchant marine, in the Blue Book of American Shipping. Just from the press. Marine Review Pub. Co., Cleveland.



ONE OF THESE BINDERS

that will hold 52 NUMBERS of the

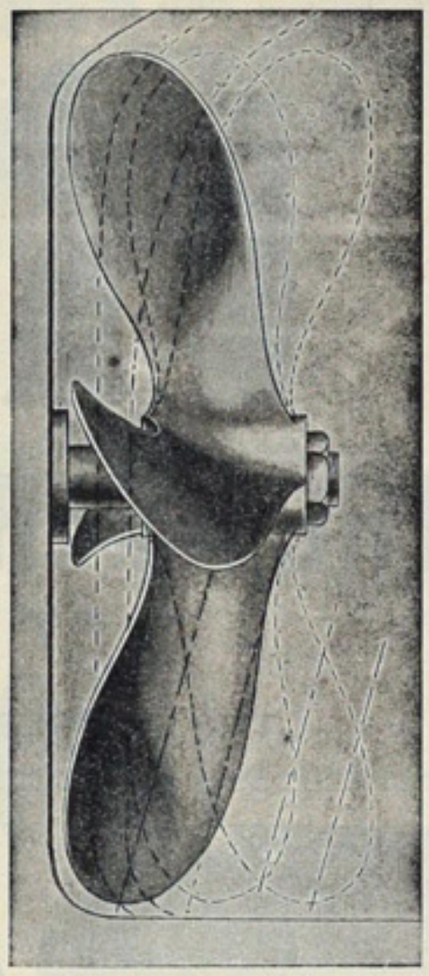
MARINE REVIEW,

Will be mailed to any address or receipt of $1.

MARINE REVIEW..

Perry-Payne Bldg.
CLEVELAND, O.

The Case Perfected



Outward Thrust Propeller Wheel.

Investigate! Make Inquiry of Those Who Know!

These wheels are now in use on the following named yachts of Detroit, Mich.:

SEA FOX, TRUANT,
BONITA, DAWN.

A reduction in vibration and gain in speed guaranteed on all these boats. The conditions were more than met, and the wheels paid for.

SEND FOR 1899 CATALOGUE.

A. Wells Case & Son,

HIGHLAND PARK, HARTFORD CO., CONN.

THE WELLS LIGHT MFG. CO.

EDWARD ROBINSON SOLE PROPRIETOR

46 WASHINGTON STREET. NEW YORK.

WELLS

THE "WELLS LIGHT" REG
WALLWORK & WELLS PATENTS

12,000 IN USE.

ESPECIALLY ADAPTED FOR
CONTRACTORS, QUARRIES, SHOVELS, RAILROAD CONSTRUCTION, DREDGES, BRIDGE & DOCK BUILDERS, WATER WORKS, BRICK YARDS & COAL DOCKS.

LIGHT

800, 2,000 TO 4,000
CANDLE POWER FROM KEROSENE OIL.
PORTABLE, SELF-CONTAINED, AUTOMATIC,
UNAFFECTED BY WEATHER,
400 RAILROADS
AND OVER 500 CONTRACTORS NOW USE WELLS LIGHT.

Youghiogheny River Coal Co.,

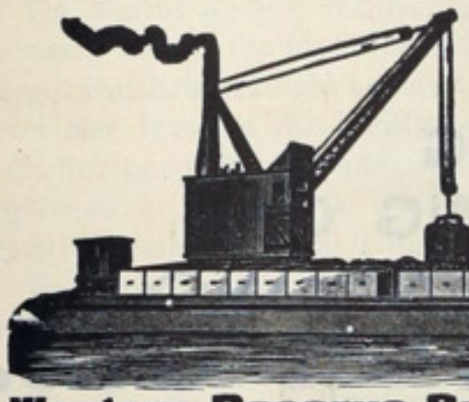
MINERS AND SHIPPERS OF

OCEAN MINE YOUGHIOGHENY GAS AND STEAM COAL

General Office, ERIE, PA. Long Dist. Tel. No. 409.
Shipping Docks, ASHTABULA, O. Long Dist. Tel. No. 76.

VESSELS FUELED at all hours with OCEAN Coal only, by Steam Lighter or Car Dump. Electric Light.

Pickands, Mather & Co.,

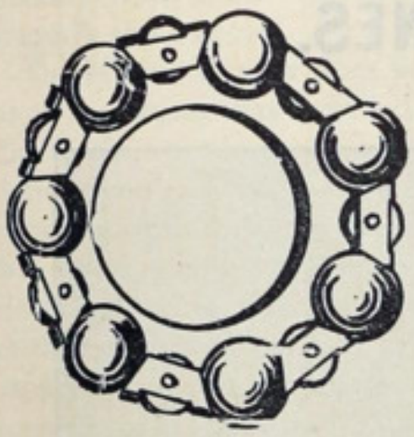


FUEL LIGHTERS AT BUFFALO, ERIE, ASHTABULA AND CLEVELAND.

At DETOUR, MICH., A FUEL DOCK equipped with Shute capacity of 600 Tons.

Best Quality PITTSBURGH COAL furnished at any time during Day or Night.

Western Reserve Building, CLEVELAND, O.



THE

"Cleveland"

A BICYCLE BUILT TO LAST.

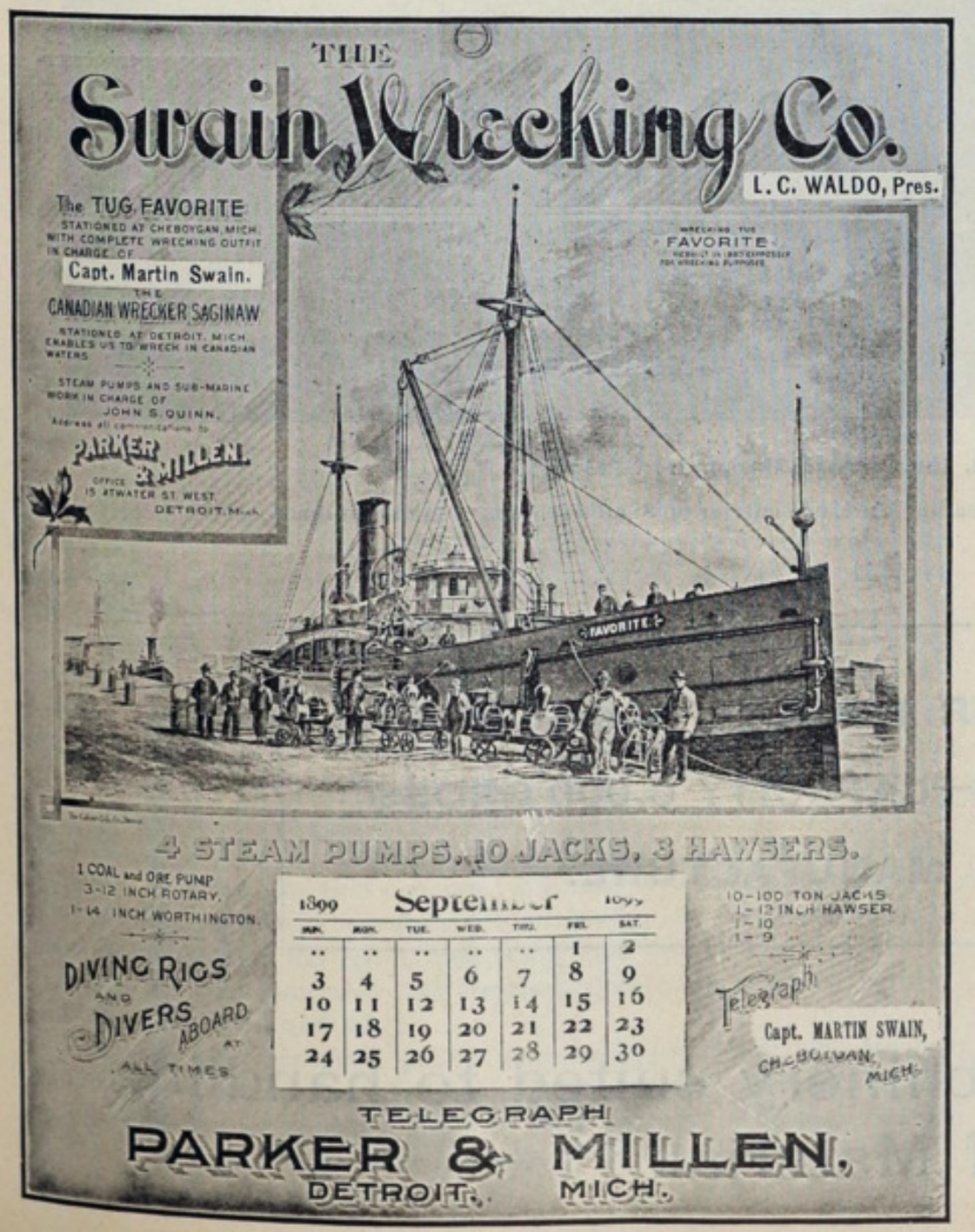
Our New BURWELL BALL AND ROLLER BEARING Saves One-Half your Labor.

1899 PRICES:

$35.00. $40.00. $50.00, $75.00

H. A. LOZIER & CO.,

'Phone M. 816. 277-279 ERIE ST.


THE
Swain Wrecking Co.
L. C. WALDO, Pres.
The TUG FAVORITE
STATIONED AT CHEBOYGAN, MICH. WITH COMPLETE WRECKING OUTFIT IN CHARGE OF
Capt. Martin Swain.
THE CANADIAN WRECKER SAGINAW
STATIONED AT DETROIT, MICH. ENABLES US TO WRECK IN CANADIAN WATERS
STEAM PUMPS AND SUB-MARINE WORK IN CHARGE OF JOHN S. QUINN.
PARKER & MILLEN
OFFICE 15 ATWATER ST. WEST DETROIT, Mich.
FAVORITE
4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.
1 COAL and ORE PUMP 3-12 INCH ROTARY. 1-14 INCH WORTHINGTON.
DIVING RIGS AND DIVERS ABOARD AT ALL TIMES
1899 September 1899
SUN. MON. TUE. WED. THU. FRI. SAT.
.. .. 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
10-100 TON JACKS 1-12 INCH HAWSER 1-10 1-9
Telegraph
Capt. MARTIN SWAIN, CHEBOYGAN, MICH.
TELEGRAPH
PARKER & MILLEN,
DETROIT, MICH.

The W. L. SCOTT COMPANY ERIE, PA.

WHOLESALE DEALER IN

SHAMOKIN ANTHRACITE WILKESBARRE COALS YOUGHIOGHENY PITTSBURG MANSFIELD.

VESSEL FUELING A SPECIALTY By STEAM LIGHTER or Car Dump at All Hours. Electric Light.

Main Office, Scott Block, Long Distance Telephone No. 440.
Fueling Office, Canal Dock, Long Distance Telephone No. 320.

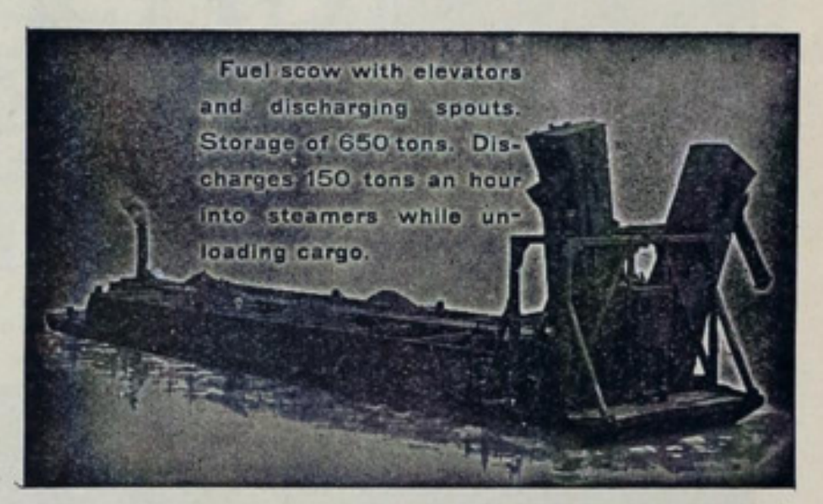
COAL

COAL

Steamboat Fuel at Ashtabula,

LARGE SUPPLIES OF BEST QUALITY.

Lighter Carrying Different Grades at all Times.


Fuel scow with elevators and discharging spouts. Storage of 650 tons. Discharges 150 tons an hour into steamers while unloading cargo.

M. A. HANNA & CO., Miners and Shippers. Main Office, Perry-Payne Bldg., Cleveland.

Have You Any Interest in Ships?

Do You Wish to Reach..

Ship Builders, Ship Owners, Naval Architects, Marine Engineers, or in fact anyone connected with the Merchant Marine or Navy?

The Blue Book of American Shipping is the Only Marine and Naval Directory of the United States.

STATISTICS OF AMERICAN SHIPPING.
MORE THAN 100 ELEGANT ILLUSTRATIONS.
DELIVERED IN ANY PART OF THE WORLD AT $5.00.

Marine Review Publishing Co.,
CLEVELAND, OHIO.

FOR SALE.

A wooden package freight steamer. Length 216 feet, beam 32 feet. Inquire H. C. FRENCH, Buffalo, N. Y.

Aug. 31.

McMyler Manufacturing Company,

180 Columbus Street, CLEVELAND, O.

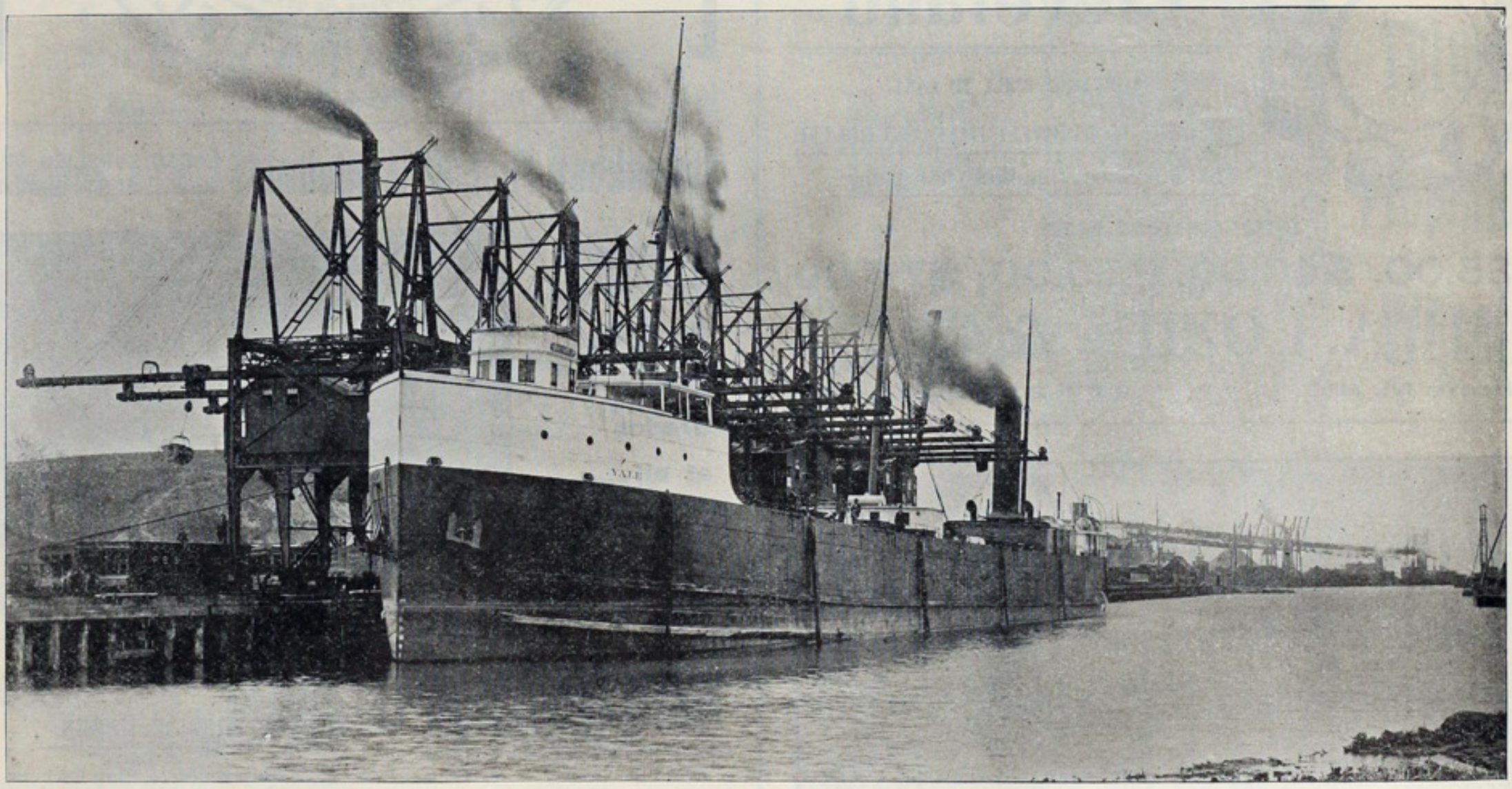
BUILDERS OF ALL KINDS OF

MACHINERY

FOR RAPID LOADING AND UNLOADING OF

Coal and Iron Ore.

HIGHEST DEVELOPMENT OF CAR DUMPING MACHINES.



Modern Ore Dock Equipment at Conneaut, the Carnegie Harbor, on Lake Erie.

View from water side of McMyler direct ore unloaders --Steel Steamer Yale, ore carrier of about 5,000 tons capacity, at dock

A PLANT AT CONNEAUT FOR DIRECT TRANSFER OF ORE FROM SHIPS TO CARS—CAPACITY 6,000 GROSS TONS PER DAY—IS OF OUR MANUFACTURE.

Plans and Estimates for Machinery suited to handling all kinds of Material.